Message

From: Turville Rick [Rick.Turville@kalmancoinc.com]
Sent: 9/5/2021 7:34:08 PM
To: Taylor, Jillianne [Taylor.Jillianne@epa.gov]
CC: mark [mark@spectralsystemsglobal.com]
Subject: Updated report for 4 Sept 2021
Attachments: ASPECT Summary - Hurricane Ida 4 September 2021 V3.docx

Jill,
Please find attached an updated version of the report for 4 September 2021 showing ammonia detections. The majority of the detections are very small but there is a short distance with levels up to 14 ppm.

If you have any questions please let me or Mark know.

R/ Rick

90045040

Airborne
Spectral
Photometric
Environmental
Collection
Technology

ASPECT Air Quality Survey
Baton Rouge, LA.
September 4, 2021

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Acronyms and Abbreviations

Alt	Altitude (in feet)
AGL	Above Ground Level
cm	centimeter
CDT	Central Daylight Time
DEM	Digital Elevation Model
ESF-10	Emergency Support Function #10 – Oil and Hazardous Materials Response
FEMA	Federal Emergency Management Agency
ft	feet
FTIR	Fourier Transform Infrared Spectrometer
FTP	File Transfer Protocol
igm	Spectral data format based on grams format
IR	Infrared
IRLS	Infrared Line Scanner
jpg	JPEG image format
kts	knots
mph	miles per hour
m/s	meters per second
MSIC	Digital photography file from the Imperx mapping camera
MSL	Mean Sea Level Altitude (in feet)
PAN	peroxyacetyl nitrate
Ppm	parts per million
RMP	Risk Management Plan

UTC	Universal Time Coordinated

Executive Summary

Hurricane Ida made landfall at 11:55 AM CDT Sunday, August 30 as a high-end category-4 hurricane, with maximum sustained winds of 150 mph. The storm moved ashore near Port Fourchon, Louisiana after a period of rapid intensification, tying for the fifth strongest landfalling continental US hurricane on record with Hurricane Laura of 2020, among three other hurricanes. Severe wind and large-scale flood damage have been reported to property and infrastructure in much of southeast Louisiana, including significant damage in New Orleans, Louisiana. In addition, Ida has caused widespread damage across the Mid-Atlantic and Northeast US.

On September 2nd, 2021, the State of Louisiana requested ESF-10 assistance through FEMA and Region 6 asked for the ASPECT plane to be deployed in support of the response to Hurricane Ida. The state wanted assistance monitoring facility emissions in the industrial area between Baton Rouge and New Orleans, where flaring is resulting in the visible emission of black smoke.

ASPECT was tasked to perform remote chemical sensing over target properties to screen for airborne chemicals and take high-resolution photos to provide situational awareness. Potential areas identified for monitoring included: East Baton Rouge, Ascension, Iberville, St. James, St. John, St. Charles, Jefferson, and Orleans. The system conducted one flight mission on 2 September 2021 including air monitoring survey collections over the target area with favorable weather conditions for all passes. Although two black plumes were visible over one of the sites, no major emissions were detected with the FTIR.

A continuation of the overall Baton Rouge facility survey was conducted on 3 September 2021. Two data collection flights were conducted which bracketed a Presidential temporary flight restriction not allowing any flight activity. A total of 12 active data collection passes were made covering 8 facilities with no chemical plumes or compounds being detected. Other than flares and isolated steam plumes, little process activity was noted in the data.

Flight 5 and 6 were conducted as part of survey operations conducted on 4 September 2021. A total of 17 facilities were surveyed. Ammonia was detected and confirmed at a maximum concentration of approximately 14 ppm in addition to ozone and peroxyacetyl nitrate. Analysis of IR imagery indicated that some facilities are showing hot process units.

ASPECT Air Quality Survey
Hurricane IDA
Baton Rouge, LA
September 4, 2021

Background and Operational Overview

Hurricane Ida made landfall at 11:55 AM CDT Sunday, August 30 as a high-end category-4 hurricane, with maximum sustained winds of 150 mph. The storm moved ashore near Port Fourchon, Louisiana after a period of rapid intensification, tying for the fifth strongest landfalling continental US hurricane on record with Hurricane Laura of 2020, among three other hurricanes. Severe wind and large-scale flood damage have been reported to property and infrastructure in much of southeast Louisiana, including significant damage in New Orleans, Louisiana. In addition, Ida has caused widespread damage across the Mid-Atlantic and Northeast US.

On 2 September 2021, ASPECT was tasked to conduct a wide area air quality screening level assessment of areas populated with Risk Management Plan (RMP) sites and petrochemical facilities using the ASPECT system for detections of any airborne contaminants from ASPECT's 76 chemical detection library in the areas affected by Ida. The Region wanted to know if any detections were found, the location of the detection, and the concentration detected. Sites including Marathon Petroleum Company, Shell Norco Facility, and Phillips 66 pipeline site were surveyed. There were no chemical detections at the sites surveyed. Extremely slow satellite transmission speeds (possibly due to high bandwidth use by other first responders) resulted in long delays in data collection. Some chemical photos were pulled down during flight, with the majority needing to be pulled down with a more high-speed internet connection on the ground.

On 3 September 2021 ASPECT was tasked with a continuation of the general Baton Rouge area survey and conducted two flights. 8 locations in the Baton Rouge area were surveyed as part of two flights. A total of 12 active data collection passes were made covering 8 facilities with no chemical plumes or compounds being detected. Other than flares and isolated steam plumes, little process activity was noted in the data.

Flight 5 and 6 were conducted as part of survey operations conducted on 4 September 2021. Collectively, a total of 17 facilities were surveyed.

Table 1. Sites Covered on 03 September 2021 Flights 5 and 6

LBC Baton Rouge LLC - Sunshine Terminal	30.294444	-91.148333
EnLink LIG Liquids LLC - Plaquemine Gas Processing Plant	30.236389	-91.241389
Syngenta Crop Protection LLC - St Gabriel Plant	30.246728	-91.103508
TOTAL Petrochemicals & Refining USA Inc - Carville Polystyrene Plant	30.229786	-91.073631
NOVA Chemicals Olefins LLC - Geismar Ethylene Plant	30.230619	-91.052884
Lone Star NGL Refinery Services LLC - Geismar Fractionation Plant	30.218889	-91.035833
Kinder Morgan Liquids Terminals LLC - Geismar Methanol Terminal	30.205389	-91.023792
Methanex USA Services LLC - Geismar Methanol Plant	30.206667	-91.020833
Westlake Vinyls Co LP	30.209167	-91.017222
Rubicon LLC - Geismar Facility	30.20139	-91.01222
BASF Corp - North Geismar Site	30.20594	-90.99195
BASF Corp - Geismar Site	30.18425	-91.002778
Occidental Chemical Corporation - Geismar Facility	30.18819	-90.98188
CF INDUSTRIES	30.08328002	-90.957665
South LA Methanol LP - St James Methanol Plant	30.039917	-90.863819
Mosaic Fertilizer LLC - Uncle Sam Plant	30.037222	-90.8275
NuStar Logistics LP - St James Terminal	30.030065	-90.843463

General Mission Objectives

Once granted access to fly over the sites, the following general mission objectives were employed in conducting data collection with ASPECT:

1. To capture an overall, situational awareness of the incident using aerial photography with:
    - Oblique camera—photos taken by hand from the view/position of the co-pilot, and
    - MSIC photos—advanced camera mounted underneath the plane for a top-down view of the designated sites.
2. To qualitatively locate and characterize any the visible and non-visible components of a plume, as well as any areas on fire:
    - Using the Infrared Line Scanner (IRLS)
3. To screen for the presence and location of specific chemicals within ASPECT's automated chemical detection library:
    - Using the Fourier Transform Infrared (FTIR) Spectrometer

Flight Conditions and Status

Weather and Site Conditions

Prior to each flight, an updated status of the current and forecasted weather, site conditions and any potential flight obstacles including radio towers impacting safety is assessed by the

crew. A summary of the ground weather conditions during the missions can be found in Table 2 and 3.

Table 2. Ground Weather for Baton Rouge, LA, Flight 5
4 September 2021

Time	953	1053	1153	1253	1353	1453
Wind direction	67.5 degrees ENE	112.5 degrees ESE	292.5 degrees WNW	315 degrees NW	0 degrees	0 degrees
Wind speed	1.3 m/s (3.0 mph)	2.2 m/s (5.0 mph)	2.2 m/s (5.0 mph)	2.2 m/s (5.0 mph)	2.7 m/s (6.0 mph)	1.3 m/s (3.0 mph)
Temperature	27.8 C	30.0 C	31.1 C	31.7 C	31.7 C	32.8 C
Relative humidity	74	70	66	61	61	56
Dew point	22.8 C	23.9 C	23.9 C	23.3 C	23.3 C	22.8 C
Pressure	1013.9 mb	1014.3 mb	1013.9 mb	1013.6 mb	1013.3 mb	1012.3 mb
Ceiling	Clear	Clear	Scattered 4200 Ft	Few 3900 Ft	Scattered 4200 Ft	Few 4600 Ft

Table 3. Ground Weather for Baton Rouge, LA, Flight 6
4 September 2021

Time	1653	1753	1853	1953
Wind direction	0 degrees N	0 degrees N	337.5 degrees NNW	337.5 degrees NNW
Wind speed	4.5 m/s (10.0 mph)	2.7 m/s (6.0 mph)	1.3 m/s (3.0 mph)	2.2 m/s (5.0 mph)
Temperature	23.9 C	24.4 C	23.9 C	21.7 C
Relative humidity	69	67	71	79
Dew point	17.8 C	17.8 C	18.3 C	17.8 C
Pressure	983.8 mb	983.8 mb	983.8 mb	984.1 mb
Ceiling	Overcast 2700 Ft	Broken 2800 Ft	Few 3200 Ft	Clear

Data Results

The following data is provided as a summary analysis. All data products are available for the Region to access on a shared FTP site. For a complete list of available products, see Appendix A. The data collected during these missions included a flight path summary, IRLS images, FTIR chemical identification and quantification, high resolution MSIC photos, and oblique photos.

Flight Paths

Wide, slow turns are required to be made in between runs to keep the instruments stable. The blue lines indicate the flight path while the green lines indicate the specific sections of the flight where chemical data was collected and processed. On Flight 1 the Baton Rouge area was surveyed, and the flight path is shown in Figure 1 and 2.

Figure 1. Data Collection Flight Path over the Baton Rouge Area Fight 5, 4 September 2021

Figure 2. Data Collection Flight Path over the Baton Rouge Area Fight 6,

4 September 2021

Line Scanner Data Results

A total of 31 data collection runs were made over the target facilities and an infrared line scanner image was generated for each collection run. Figure 3 shows a 3-band infrared image collected over the CF Industries facility. Thermal analysis shows that many of the facilities are showing process units have some activity. The process unit located in the middle of figure 3 indicates hot units and hot piping. Other than thermal, no chemical plumes can be observed being emitted from the facility. Figure 4 shows a similar image collected on Flight 6 over the Occidental Chemical facility.

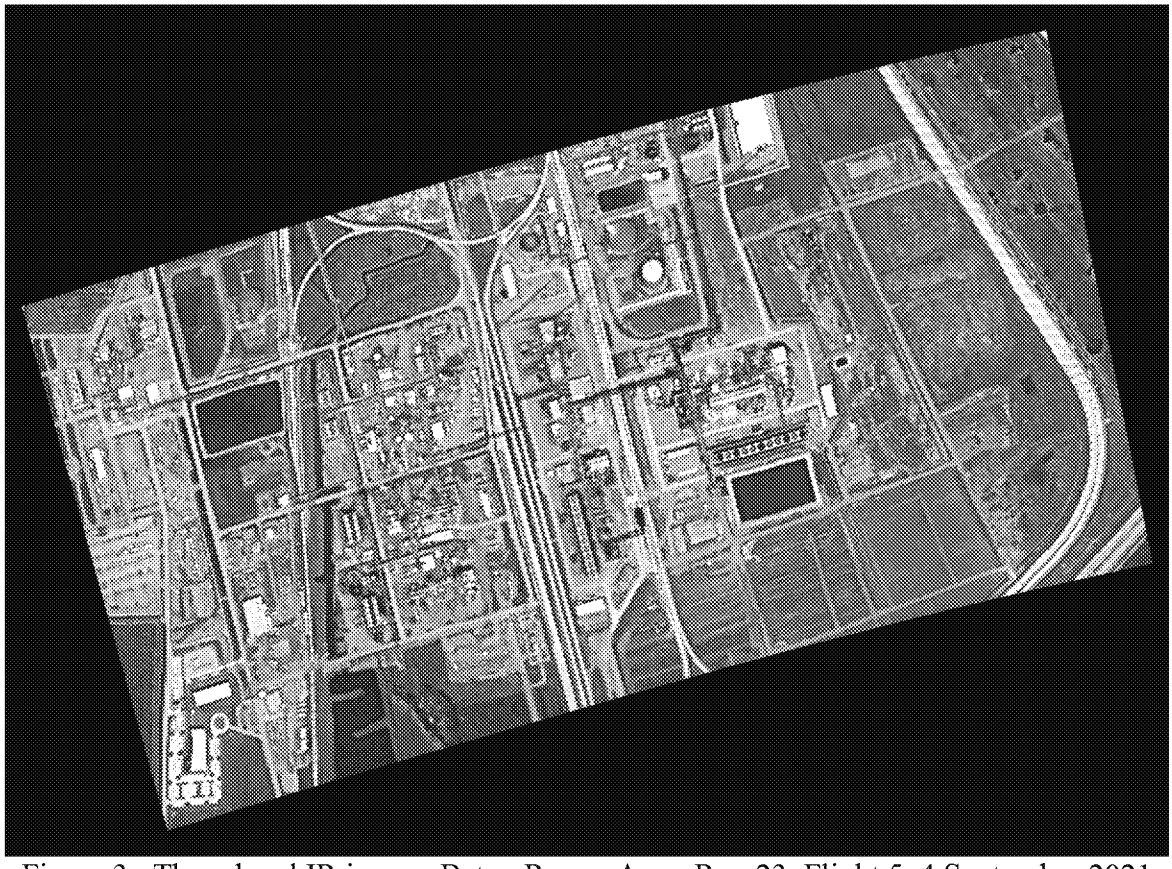


Figure 3. Three band IR image, Baton Rouge Area, Run 23, Flight 5, 4 September 2021

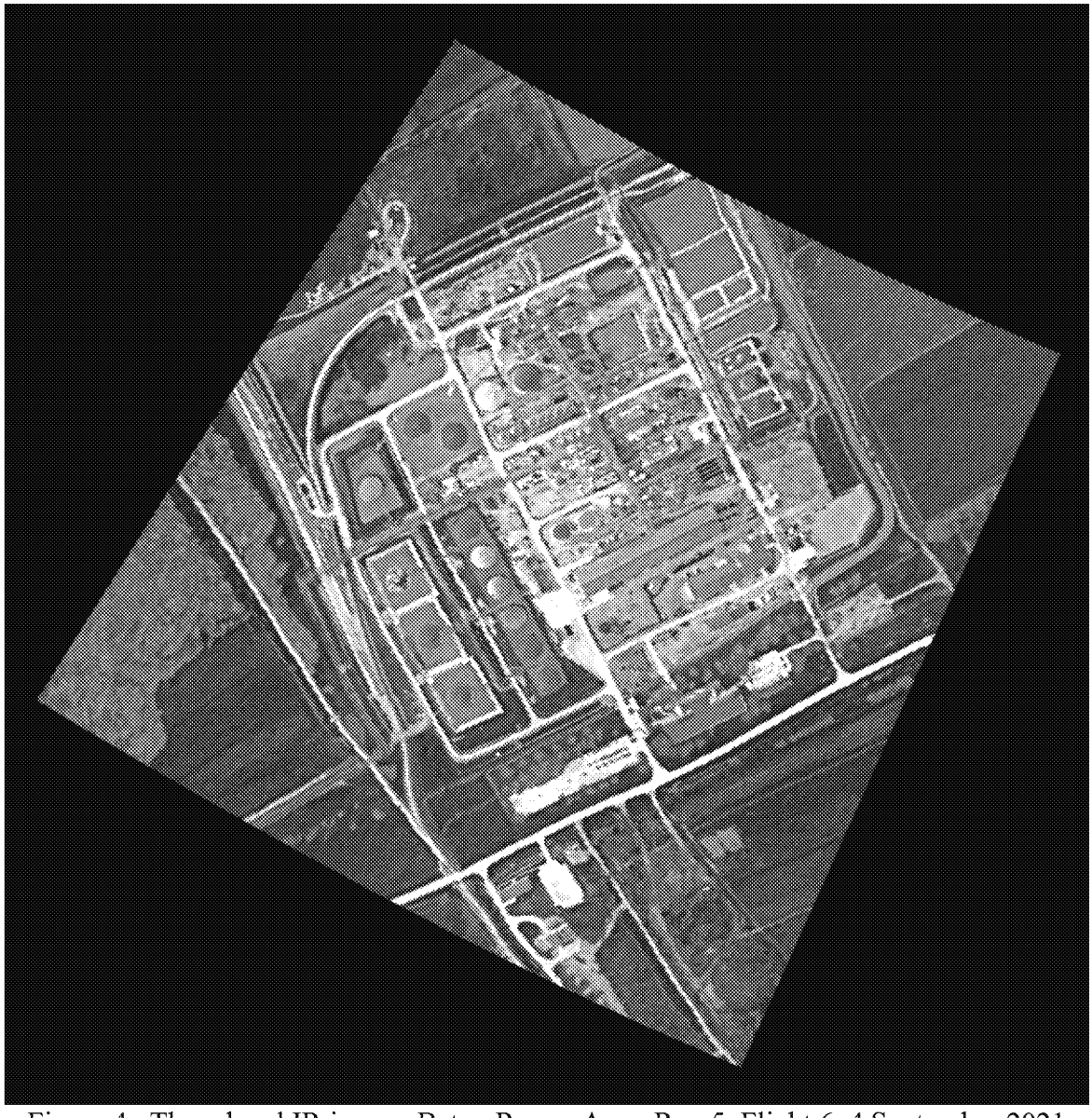


Figure 4. Three band IR image, Baton Rouge Area, Run 5, Flight 6, 4 September 2021

FTIR Data Results

FTIR spectral data at a resolution of 16 wavenumbers was collected for each run. ASPECT uses an automated detection algorithm to permit compounds to be automatically analyzed while the aircraft is in flight. Seventy-six chemical compounds are included in the airborne algorithm library (the list is provided in Appendix B, Table 1). In addition, collected data was also manually quality checked against a collection of published library spectra for each chemical detected.

Ground analysis and confirmation of airborne data found detectable quantities of ammonia on passes 10 and 11 at a maximum concentration of approximately 14.7 ppm. Figure 5

shows a plot of detected ammonia with the characteristic peaks at 930 and 960 wavenumbers. Figure 6 shows the locations of the ammonia detections. No other significant detections were noted in the survey. Details of the monitoring results can be found in Table 4 and 5.

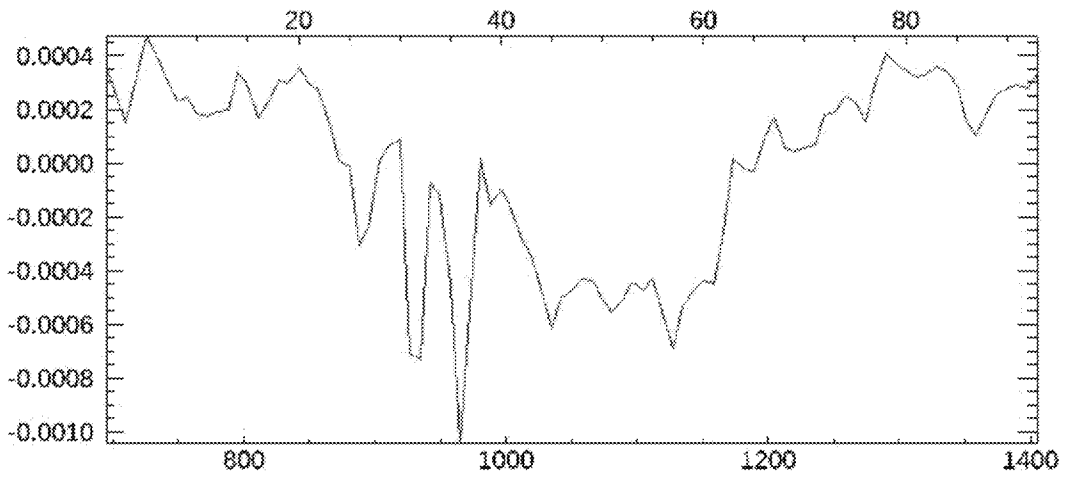


Figure 5. Ammonia Spectrum Flight 5, Run 10

Figure 6. Ammonia Detection Locations, Flight 5, Runs 10 and 11

Table 4. Chemical Results Summary
Baton Rouge Collection Area, Flight 5

Pass	Date	Time (UTC)	Chemical	Max Concentration (ppm)
1	2021-09-04	14:13:50	Test	Test
2		15:01:22	ND	ND
3		15:12:15	ND	ND
4		15:24:47	ND	ND
5		15:32:46	ND	ND
6		15:42:23	ND	ND
7		15:51:20	ND	ND
8		16:02:17	ND	ND
9		16:09:39	ND	ND
10		16:18:48	Ammonia	10.4
11		16:27:35	Ammonia	14.7
12		16:35:25	ND	ND
13		16:45:24	ND	ND
14		16:52:56	ND	ND
15		17:07:25	ND	ND
16		17:18:42	ND	ND
17		17:28:17	ND	ND
18		17:34:43	ND	ND
19		17:49:52	ND	ND
20		17:56:26	ND	ND
21		18:08:41	ND	ND
22		18:15:49	ND	ND
23		18:21:56	ND	ND

Table 5. Chemical Results Summary
Baton Rouge Collection Area, Flight 6

Pass	Date	Time (UTC)	Chemical	Max Concentration (ppm)
1	2021-09-04	22:50:57	ND	ND
2		22:54:08	ND	ND
3		23:05:33	ND	ND
4		23:22:35	ND	ND
5		23:25:21	ND	ND
6		23:34:31	ND	ND
7		23:36:23	ND	ND

Aerial Photography Results

A full set of high-resolution aerial digital photography were collected as part of each data collection pass. Weather conditions over the Baton Rouge allowed high quality aerial images to be collected. Figures 7 shows a representative aerial image collected over the Syngenta Crop Protection facility. Figure 8 shows a representative oblique with evidence of plant activity due to the steam plume.

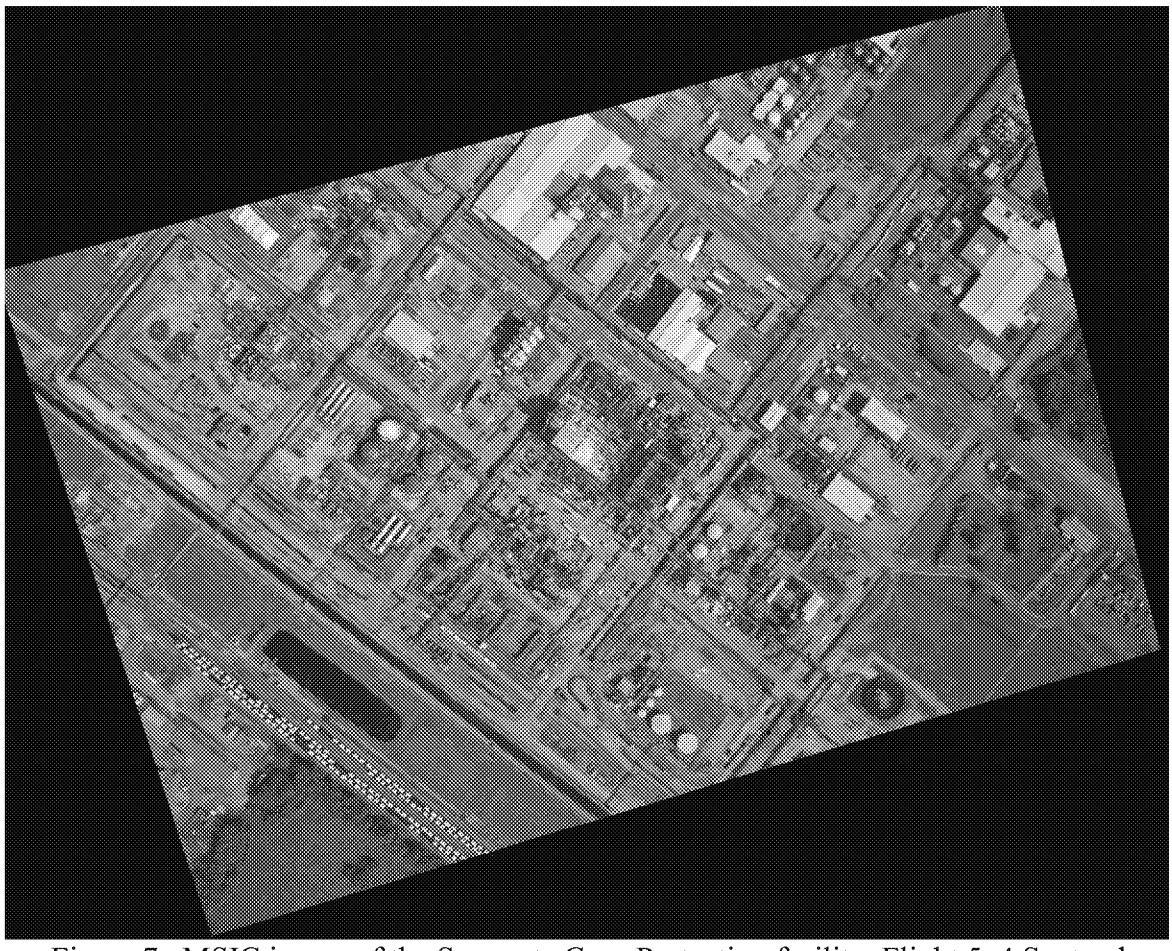


Figure 7. MSIC image of the Syngenta Crop Protection facility, Flight 5, 4 September 2021

Figure 8. Oblique photo taken over the TBD Facility as part of Flight 5, 4 September 2021

Conclusion

Two data collection flights were conducted on 4 September 2021 focusing on facilities south of Baton Rouge. A total of 29 active data collection passes were made covering 17 facilities. Analysis of IR imagery indicated that some facilities are showing hot process units. Ammonia was detected and confirmed at a maximum concentration of approximately 14 ppm.

Appendix A: File Names of Data Collected During Flight

Baton Rouge Collection Areas, Flight 5, 4 September 2021

Run#	Time (UTC)	Altitude (MSL)	Velocity (knots)	MSIC Data Files	FTIR Data Files	IRLS Data Files	Gamma Files
1	14:13:50	5761	155	20210904141356969.jpg 20210904141403318.jpg 20210904141409674.jpg	20210904_141354_A.igm	2021_09_04_14_13_55_R_01 TA=20.6;TB=41.4;Gain=3	
2	15:01:22	2861	105	20210904150128661.jpg 20210904150135011.jpg 20210904150141375.jpg	20210904_150125_A.igm	2021_09_04_15_01_28_R_02 TA=22.5;TB=42.4;Gain=3	
3	15:12:15	2899	106	20210904151221430.jpg 20210904151227795.jpg 20210904151234138.jpg	20210904_151219_A.igm	2021_09_04_15_12_20_R_03 TA=24.9;TB=44.9;Gain=3	
4	15:24:47	2883	108	20210904152453167.jpg 20210904152459532.jpg 20210904152505881.jpg	20210904_152450_A.igm	2021_09_04_15_24_52_R_04 TA=25.0;TB=44.9;Gain=3	
5	15:32:46	2885	107	20210904153252537.jpg 20210904153258886.jpg 20210904153305250.jpg 20210904153312514.jpg	20210904_153249_A.igm	2021_09_04_15_32_52_R_05 TA=24.7;TB=44.9;Gain=3	
6	15:42:23	2904	105	20210904154229045.jpg 20210904154235410.jpg 20210904154241760.jpg 20210904154248110.jpg 20210904154254474.jpg 20210904154301728.jpg	20210904_154226_A.igm	2021_09_04_15_42_28_R_06 TA=26.1;TB=45.2;Gain=3	
7	15:51:20	2901	105	20210904155126521.jpg 20210904155132871.jpg 20210904155139231.jpg 20210904155145580.jpg 20210904155151945.jpg 20210904155158294.jpg	20210904_155123_A.igm	2021_09_04_15_51_25_R_07 TA=24.6;TB=44.7;Gain=3	
8	16:02:17	2891	110	20210904160222922.jpg 20210904160229287.jpg 20210904160235646.jpg 20210904160241995.jpg 20210904160249259.jpg	20210904_160220_A.igm	2021_09_04_16_02_22_R_08 TA=25.5;TB=45.4;Gain=3	
9	16:09:39	2926	105	20210904160945066.jpg 20210904160951431.jpg 20210904160958685.jpg 20210904161005049.jpg 20210904161011398.jpg 20210904161014122.jpg	20210904_160942_A.igm	2021_09_04_16_09_45_R_09 TA=26.2;TB=46.4;Gain=3	
10	16:18:48	2917	108	20210904161854355.jpg 20210904161900704.jpg 20210904161907054.jpg 20210904161913419.jpg 20210904161920673.jpg 20210904161927037.jpg	20210904_161851_A.igm	2021_09_04_16_18_54_R_10 TA=26.4;TB=46.4;Gain=3	
11	16:27:35	2931	107	20210904162741837.jpg 20210904162748186.jpg 20210904162754551.jpg 20210904162800900.jpg 20210904162807249.jpg 20210904162813614.jpg	20210904_162738_A.igm 20210904_162817_A.igm	2021_09_04_16_27_41_R_11 TA=26.3;TB=46.6;Gain=3	

				20210904162819963.jpg 20210904162826328.jpg			
12	16:35:25	2916	108	20210904163531214.jpg 20210904163537563.jpg 20210904163543928.jpg 20210904163551184.jpg 20210904163557549.jpg 20210904163603898.jpg 20210904163610263.jpg 20210904163616612.jpg	20210904_163528_A.igm 20210904_163608_A.igm	2021_09_04_16_35_31_R_12 TA=26.5;TB=46.6;Gain=3	
13	16:45:24	2914	114	20210904164531333.jpg 20210904164537688.jpg 20210904164544037.jpg	20210904_164527_A.igm	2021_09_04_16_45_30_R_13 TA=26.5;TB=46.6;Gain=3	
14	16:52:56	2877	109	20210904165302552.jpg 20210904165309821.jpg 20210904165316170.jpg 20210904165322535.jpg 20210904165328885.jpg	20210904_165300_A.igm	2021_09_04_16_53_02_R_14 TA=27.1;TB=47.3;Gain=3	
15	17:07:25	2888	107	20210904170731415.jpg 20210904170737764.jpg 20210904170744113.jpg 20210904170751383.jpg 20210904170757737.jpg 20210904170804102.jpg 20210904170810445.jpg 20210904170816810.jpg 20210904170823153.jpg 20210904170829518.jpg 20210904170835867.jpg 20210904170842232.jpg	20210904_170729_A.igm 20210904_170808_A.igm	2021_09_04_17_07_31_R_15 TA=26.7;TB=46.7;Gain=3	
16	17:18:42	2896	103	20210904171848705.jpg 20210904171855055.jpg 20210904171902324.jpg 20210904171908673.jpg 20210904171915023.jpg 20210904171921387.jpg 20210904171927737.jpg 20210904171934101.jpg 20210904171940451.jpg 20210904171946800.jpg 20210904171948625.jpg	20210904_171845_A.igm 20210904_171924_A.igm	2021_09_04_17_18_49_R_16 TA=32.7;TB=52.1;Gain=3	
17	17:28:17	2896	109	20210904172823395.jpg 20210904172829744.jpg 20210904172836109.jpg 20210904172842458.jpg 20210904172848823.jpg 20210904172856077.jpg 20210904172902442.jpg 20210904172908785.jpg	20210904_172820_A.igm 20210904_172859_A.igm	2021_09_04_17_28_23_R_17 TA=28.2;TB=48.3;Gain=3	
18	17:34:43	2872	100	20210904173449245.jpg 20210904173455610.jpg 20210904173501959.jpg 20210904173508324.jpg 20210904173514673.jpg 20210904173521943.jpg 20210904173528292.jpg 20210904173534651.jpg 20210904173541000.jpg	20210904_173446_A.igm 20210904_173525_A.igm	2021_09_04_17_34_49_R_18 TA=29.1;TB=49.0;Gain=3	
19	17:49:52	2912	124	20210904174958958.jpg 20210904175005323.jpg	20210904_174954_A.igm	2021_09_04_17_49_58_R_19 TA=31.1;TB=51.0;Gain=3	

				20210904175011672.jpg 20210904175018021.jpg			
20	17:56:26	2882	102	20210904175632080.jpg 20210904175638430.jpg 20210904175644794.jpg 20210904175651151.jpg 20210904175658405.jpg 20210904175704754.jpg 20210904175711119.jpg 20210904175717468.jpg 20210904175723832.jpg 20210904175730182.jpg	20210904_175629_A.igm 20210904_175709_A.igm	2021_09_04_17_56_32_R_20 TA=29.7;TB=49.6;Gain=3	
21	18:08:41	2901	99	20210904180847467.jpg 20210904180854731.jpg 20210904180901096.jpg 20210904180907445.jpg 20210904180913794.jpg 20210904180920159.jpg	20210904_180844_A.igm	2021_09_04_18_08_48_R_21 TA=28.3;TB=48.5;Gain=3	
22	18:15:49	2905	113	20210904181555083.jpg 20210904181601447.jpg 20210904181607797.jpg 20210904181614161.jpg 20210904181620511.jpg 20210904181627780.jpg	20210904_181551_A.igm	2021_09_04_18_15_55_R_22 TA=33.5;TB=53.6;Gain=3	
23	18:21:56	2896	114	20210904182201886.jpg 20210904182209140.jpg 20210904182215489.jpg 20210904182221854.jpg 20210904182228203.jpg 20210904182234568.jpg	20210904_182158_A.igm	2021_09_04_18_22_02_R_23 TA=33.4;TB=53.6;Gain=3	

Baton Rouge Collection Areas, Flight 6, 4 September 2021

Run#	Time (UTC)	Altitude (MSL)	Velocity (knots)	MSIC Data Files	FTIR Data Files	IRLS Data Files	Gamma Files
1	22:50:57	2910	109	20210904225102949.jpg 20210904225109314.jpg 20210904225115663.jpg	20210904_225100_A.igm	2021_09_04_22_51_01_R_01 TA=29.8;TB=50.5;Gain=3	
2	22:54:08	2934	102	20210904225413613.jpg 20210904225419962.jpg 20210904225426327.jpg	20210904_225411_A.igm	2021_09_04_22_54_12_R_02 TA=23.1;TB=43.9;Gain=3	
3	23:05:33	2920	101	20210904230539979.jpg 20210904230546344.jpg 20210904230552693.jpg 20210904230559042.jpg 20210904230605407.jpg 20210904230611757.jpg 20210904230618106.jpg 20210904230625375.jpg 20210904230631725.jpg 20210904230638089.jpg	20210904_230537_A.igm 20210904_230617_A.igm	2021_09_04_23_05_38_R_03 TA=23.0;TB=43.2;Gain=3	
4	23:22:35	2870	107	20210904232240461.jpg 20210904232247728.jpg 20210904232254077.jpg 20210904232300442.jpg 20210904232306791.jpg	20210904_232239_A.igm	2021_09_04_23_22_39_R_04 TA=24.3;TB=44.4;Gain=3	
5	23:25:21	2928	103	20210904232528425.jpg 20210904232534774.jpg 20210904232541139.jpg	20210904_232525_A.igm	2021_09_04_23_25_26_R_05 TA=24.3;TB=44.3;Gain=3	

6	23:34:31	3002	111	20210904233437701.jpg 20210904233444050.jpg 20210904233450402.jpg 20210904233456767.jpg	20210904_233434_A.igm	2021_09_04_23_34_35_R_06 TA=21.9;TB=41.8;Gain=3	
7	23:36:23	2878	109	20210904233628468.jpg 20210904233635722.jpg 20210904233642081.jpg 20210904233648430.jpg	20210904_233627_A.igm	2021_09_04_23_36_27_R_07 TA=21.9;TB=41.8;Gain=3	

Appendix B: Priority Sites Provided by EPA Region 6 & Louisiana Department of Environmental Quality

Facility_Name	Latitude	Longitude	Parish
Deltech LLC - Baton Rouge Facility	30.552892	-91.200536	East Baton Rouge
ExxonMobil Chemical Co - Baton Rouge Plastics Plant	30.551419	-91.175611	East Baton Rouge
ExxonMobil Baton Rouge Chemical Plant	30.484336	-91.169644	East Baton Rouge
Marathon Petroleum Co LP	30.068394	-90.596364	St. John the Baptist
Westlake Vinyls Co LP	30.209167	-91.017222	Ascension
Valero Refining - Meraux LLC - Meraux Refinery	29.930222	-89.944917	St. Bernard
Cornerstone Chemical Company	29.964722	-90.264722	Jefferson
Chalmette Refining LLC	29.937903	-89.969903	St. Bernard
ExxonMobil Chemical Company - Baton Rouge Chemicals North Plant	30.50465	-91.173219	East Baton Rouge
Equilon Enterprises LLC - Norco Refinery	29.995372	-90.410167	St. Charles
The Dow Chemical Company - Louisiana Operations	30.313927	-91.240586	Iberville
Rubicon LLC - Geismar Facility	30.20139	-91.01222	Ascension
BASF Corp - Geismar Site	30.18425	-91.002778	Ascension
Union Carbide Corp - St. Charles Plant	29.982289	-90.455622	St. Charles
Phillips 66 Co - Alliance Refinery	29.68406	-89.98145	Plaquemines
Axiall LLC - Plaquemine Facility	30.267167	-91.184258	Iberville
ExxonMobil Fuels & Lubricants Co - Baton Rouge Refinery	30.484392	-91.169444	East Baton Rouge
Equilon Enterprises LLC dba Shell Oil Products US - Convent Refinery	30.107684	-90.890796	St. James
Marathon Petroleum Company LP - Louisiana Refining Division - Garyville Refinery	30.061322	-90.593528	St. John the Baptist
BASF Corp - Zachary Site	29.547603	-90.523231	East Baton Rouge
Occidental Chemical Corporation - Geismar Facility	30.18819	-90.98188	Ascension
St Rose Refinery LLC - St Rose Refinery	29.950875	-90.328497	St. Charles
ExxonMobil Chemical Co - Baton Rouge Polyolefins Plant	30.56215	-91.20387	East Baton Rouge
Shell Chemical LP - Norco Chemical Plant West Site	30.004925	-90.422381	St. Charles
NOVA Chemicals Olefins LLC - Geismar Ethylene Plant	30.230619	-91.052884	Ascension
Roehm America LLC - MMA Plant	29.9575	-90.265833	Jefferson
Valero Refining - New Orleans LLC - St Charles Refinery	29.985781	-90.3955	St. Charles
Shell Chemical LP - Norco Chemical Plant - East Site	29.995556	-90.409722	St. Charles

BASF Corp - North Geismar Site	30.20594	-90.99195	Ascension
Stolthaven New Orleans, LLC - Braithwaite Facility	29.870919	-89.949339	Plaquemines
Shintech Louisiana LLC - Shintech Plaquemine Plant	30.273611	-91.173333	Iberville
Denka Performance Elastomer LLC	30.053928	-90.524792	St. John the Baptist
Formosa Plastics Corp Louisiana	30.501722	-91.185944	East Baton Rouge
DuPont Specialty Products USA LLC - Pontchartrain Site	30.05388	-90.52472	St. John the Baptist
Occidental Chemical Corp - Taft Plant	29.987222	-90.454722	St. Charles
Syngenta Crop Protection LLC - St Gabriel Plant	30.246728	-91.103508	Iberville
Mosaic Fertilizer LLC - Faustina Plant	30.083914	-90.91345	St. James
Mosaic Fertilizer LLC - Uncle Sam Plant	30.037222	-90.8275	St. James
LBC Baton Rouge LLC - Sunshine Terminal	30.294444	-91.148333	Iberville
Occidental Chemical Corporation - Convent Facility	30.055885	-90.830594	St. James
TOTAL Petrochemicals & Refining USA Inc - Carville Polystyrene Plant	30.229786	-91.073631	Iberville
Targa Midstream Services LLC	29.237034	-89.384977	Plaquemines
EnLink LIG Liquids LLC - Plaquemine Gas Processing Plant	30.236389	-91.241389	Iberville
EnLink LIG Liquids LLC - Gibson Gas Processing Plant	29.643056	-90.961944	Terrebonne
NuStar Logistics LP - St James Terminal	30.030065	-90.843463	St. James
Enterprise Gas Processing LLC - Norco Fractionation Plant	30.015411	-90.402958	St. Charles
Lone Star NGL Refinery Services LLC - Geismar Fractionation Plant	30.218889	-91.035833	Ascension
INEOS Oxide - A Division of INEOS Americas LLC	30.313889	-91.240278	Iberville
Discovery Producer Services LLC - Discovery Paradis Fractionation Plant	29.858889	-90.453333	St. Charles
Plains Marketing LP - St James Terminal	30.004341	-90.848449	St. James
Methanex USA Services LLC - Geismar Methanol Plant	30.206667	-91.020833	Ascension
Dyno Nobel LA Ammonia LLC - Ammonia Production Facilty	29.964789	-90.264625	Jefferson
Kinder Morgan Liquids Terminals LLC - Geismar Methanol Terminal	30.205389	-91.023792	Ascension
South LA Methanol LP - St James Methanol Plant	30.039917	-90.863819	St. James
YCI Methanol Plant	29.97481	-90.86775	St. James
IGP Methanol LLC - Gulf Coast Methanol Complex	29.625453	-89.926611	Plaquemines
KMe St James Holdings LLC - Methanol Terminal	29.990919	-90.841239	St. James
Kemira Chemicals Inc	29.964722	-90.264722	Jefferson
PHILLIPS 66 PIPELINE LLC	29.923889	-90.482498	St. Charles
CF INDUSTRIES	30.08328	-90.957665	Ascension

Appendix C: ASPECT Systems

The US EPA ASPECT system collects airborne infrared (IR) images and chemical screening data from a safe distance over the site (about 3,000 ft AGL). The system consists of an airborne high-speed Fourier Transform Infra-Red (FTIR) spectrometer coupled with a wide-area IR Line Scanner (IRLS). The ASPECT IR systems can detect chemical compounds in both the 8-to-12-micron (800 to 1200 cm-1) and 3 to 5 micron (2000 to 3200 cm-1) regions. List of chemicals and detection limits are listed in Table 1. The 8 to 12 micron region is typically known as the atmospheric window region since the band is reasonably void of water and carbon dioxide influence. Spectrally, this region is used to detect carbon - non-carbon bonded compounds. The 3 to 5 micron region is also free of water and carbon dioxide but typically does not have sufficient energy for use. This band does show use in high-energy environments such as fires. The carbon - hydrogen stretch is very common in this region.

An Imperx mapping camera (29 mega pixels; mapping focal plane array) is concurrently operated as part of all chemical collections. These images are often digitally processed in lower resolution, so they can be transmitted via satellite communication. All imagery is geo-rectified using both aircraft attitude correction (pitch, yaw, and roll) and GPS positional information. Imagery can be processed while in flight or approximately 600 frames per hour can be processed once the data are downloaded from the aircraft. The high-resolution images (>20 MB each) are pulled from the ASPECT after the sortie and are available later.

All aerial photographic images collected by the ASPECT system are ortho-rectified and geospatially validated by the scientific reach back team. In general, this consists of conducting geo-registration using a USGS Digital Elevation Model (DEM) which promotes superior pixel computation and lessens topographic distortion. The image is check by the team (using a Google Earth base map) for proper location and rotation.

Airborne radiological measurements are conducted using three fully integrated multi-crystal sodium iodide (NaI) RSX4 gamma ray spectrometers. Each RSX4 spectrometer contains four 4"x2"x16" doped NaI crystals each having an independent photomultiplier/ spectrometer assembly. One RSX unit is configured with an additional upward NaI crystal utilized to provide real-time cosmic ray correction. Count and energy data from each crystal and pack is combined using a self-calibrating signal processor to generate a virtual detector output. All radiological spectrometer "packs" are further combined using a signal console controlled by the on-board central computer in the aircraft. Altitude correction data is provided by a radar altimeter with internal GPS systems within the packs serving as a backup. It should be noted that no radiological measurements were conducted on this mission.

Data is processed using automated algorithms onboard the aircraft with preliminary results being sent using a satellite system to the ASPECT scientific reach back team for QA/QC analysis. Upon landing, preliminary data results are examined and validated by the

scientific reach back team.

Table 1. ASPECT Automated Compounds

This table contains ASPECT's library of automated compounds.
Detection limits are for each chemical is found in parenthesis in units of parts per million (ppm)

Acetic Acid (2.0)	Cumene (23.1)	Isoprene (6.5)	Phosphine (8.3)
Acetone (5.6)	Diborane (5.0)	Isopropanol (8.5)	Phosphorus Oxychloride (2.0)
Acrolein (8.8)	1,1-Dichloroethene (3.7)	Isopropyl Acetate (0.7)	Propyl Acetate (0.7)
Acrylonitrile (12.5)	Dichloromethane (6.0)	MAPP (3.7)	Propylene (3.7)
Acrylic Acid (3.3)	Dichlorodifluoromethane (0.7)	Methyl Acetate (1.0)	Propylene Oxide (6.8)
Allyl Alcohol (5.3)	1,1-Difluoroethane (0.8)	Methyl Acrylate (1.0)	Silicon Tetrafluoride (0.2)
Ammonia (2.0)	Difluoromethane (0.8)	Methyl Ethyl Ketone (7.5)	Sulfur Dioxide (15)
Arsine (18.7)	Ethanol (6.3)	Methanol (5.4)	Sulfur Hexafluoride (0.07)
Bis-Chloroethyl Ether (1.7)	Ethyl Acetate (0.8)	Methylbromide (60)	Sulfur Mustard (6.0)
Boron Tribromide (0.2)	Ethyl Acrylate (0.8)	Methylene Chloride (1.1)	Sulfuryl Fluoride (1.5)
Boron Triflouride (5.6)	Ethyl Formate (1.0)	Methyl Methacrylate (3.0)	Tetrachloroethylene (10)
1,3-Butadiene (5.0)	Ethylene (5.0)	MTEB (3.8)	1,1,1-Trichloroethane (1.9)
1-Butene (12.0)	Formic Acid (5.0)	Naphthalene (3.8)	Trichloroethylene (2.7)
2-Butene (18.8)	Freon 134a (0.8)	n-Butyl Acetate (3.8)	Trichloromethane (0.7)
Carbon Tetrachloride (0.2)	GA (Tabun) (0.7)	n-Butyl Alcohol (7.9)	Triethylamine (6.2)
Carbonyl Fluoride (0.8)	GB (Sarin) (0.5)	Nitric Acid (5.0)	Triethylphosphate (0.3)
Carbon Tetraflouride (0.1)	Germane (1.5)	Nitrogen Mustard (2.5)	Trimethylamine (9.3)
Chlorodifluoromethane (0.6)	Hexafluoroacetone (0.4)	Nitrogen Trifluoride (0.7)	Trimethyl Phosphite (0.4)
Chloromethane (12)	Isobutylene (15)	Phosgene (0.5)	Vinyl Acetate (0.6)

Message

From: Perovich, Gina [Perovich.Gina@epa.gov]
Sent: 9/7/2021 4:08:04 AM
To: Argenta, Edward [Argenta.Edward@epa.gov]; Taylor, Jillianne [Taylor.Jillianne@epa.gov]; Honnellio, Anthony [Honnellio.Anthony@epa.gov]; Hudson, Scott [Hudson.Scott@epa.gov]
CC: Ledbetter, Ray [Ledbetter.Ray@epa.gov]
Subject: Fwd: ASPECT Hurricane Ida Response Summary 9/5/21

FYSA - Kathleen sent the note below to Barry and Carlton. Again - many thanks on a job well done!

Sent from my iPhone

Begin forwarded message:

> **From:** "Breen, Barry" <Breen.Barry@epa.gov>
> **Date:** September 6, 2021 at 10:40:12 PM EDT
> **To:** "Salyer, Kathleen" <Salyer.Kathleen@epa.gov>
> **Cc:** "Waterhouse, Carlton" <Waterhouse.Carlton@epa.gov>, "Hilosky, Nick" <Hilosky.Nick@epa.gov>, "Brooks, Becky" <Brooks.Becky@epa.gov>, "Goldberg, Ruby" <Goldberg.Ruby@epa.gov>, "Roache, Brendan" <Roache.Brendan@epa.gov>, "Radtke, Meghan" <Radtke.Meghan@epa.gov>, "Perovich, Gina" <Perovich.Gina@epa.gov>
> **Subject: Re: ASPECT Hurricane Ida Response Summary 9/5/21**
>
> This is great— thank you!
>
> > On Sep 6, 2021, at 8:27 PM, Salyer, Kathleen <Salyer.Kathleen@epa.gov> wrote:
> >
> > Hi Barry and Carlton,
> >
> > The ASPECT team had a weather-related break today, after four back to back 12-14 hours days supporting the flight missions. They pulled together this high level summary of their work so far that I wanted to share with you. They are doing an amazing job and working hard to support the needs of LA. Also, the articles linked to below are worth a quick read if you have a moment.
> >
> > ASPECT Hurricane Ida Response Summary to Date:
> >
> > EPA's received a mission assignment to assist LA with their response to Hurricane Ida on 9/2/2021. Since that time, ASPECT has performed 7 data flights executing chemical hazard screening via multi-spectral sensing technologies and captured high resolution photography to assist LDEQ, EPA R6, and other federal partners with assessing damage to facilities. We have collected data on 59/60 of the identified priority sites along with additional targets of opportunities identified during flight or interagency discussions.
> >
> > Thus far, ASPECT has not had any chemical detections of concern. We did detect low-level ammonia concentrations at one point of interest on 9/4 and we were able to successfully demonstrate our oil detection capability to capture and measure oil sheen near Port Fourchon, LA on 9/5. To date, ASPECT has executed 31.4 hours of flight.

On 9/6/2021, ASPECT planned to complete the remaining target site and then the following course of action were being discussed: 1) perform additional passes over previously-flown priority POIs; 2) assist USCG with oil detection; and/or 3) assess new POIs from LDEQ and/or EPA R6.

Unfortunately, the 9/6 missions were canceled due weather. ASPECT is returning back to its home base in Addison, TX for the day/evening and we are watching the weather for tomorrow (09/07/21).

Attached is a graphical representation of sites visited and progress to date.

ASPECT data reports can be found and are available to the public on the response.epa.gov site:

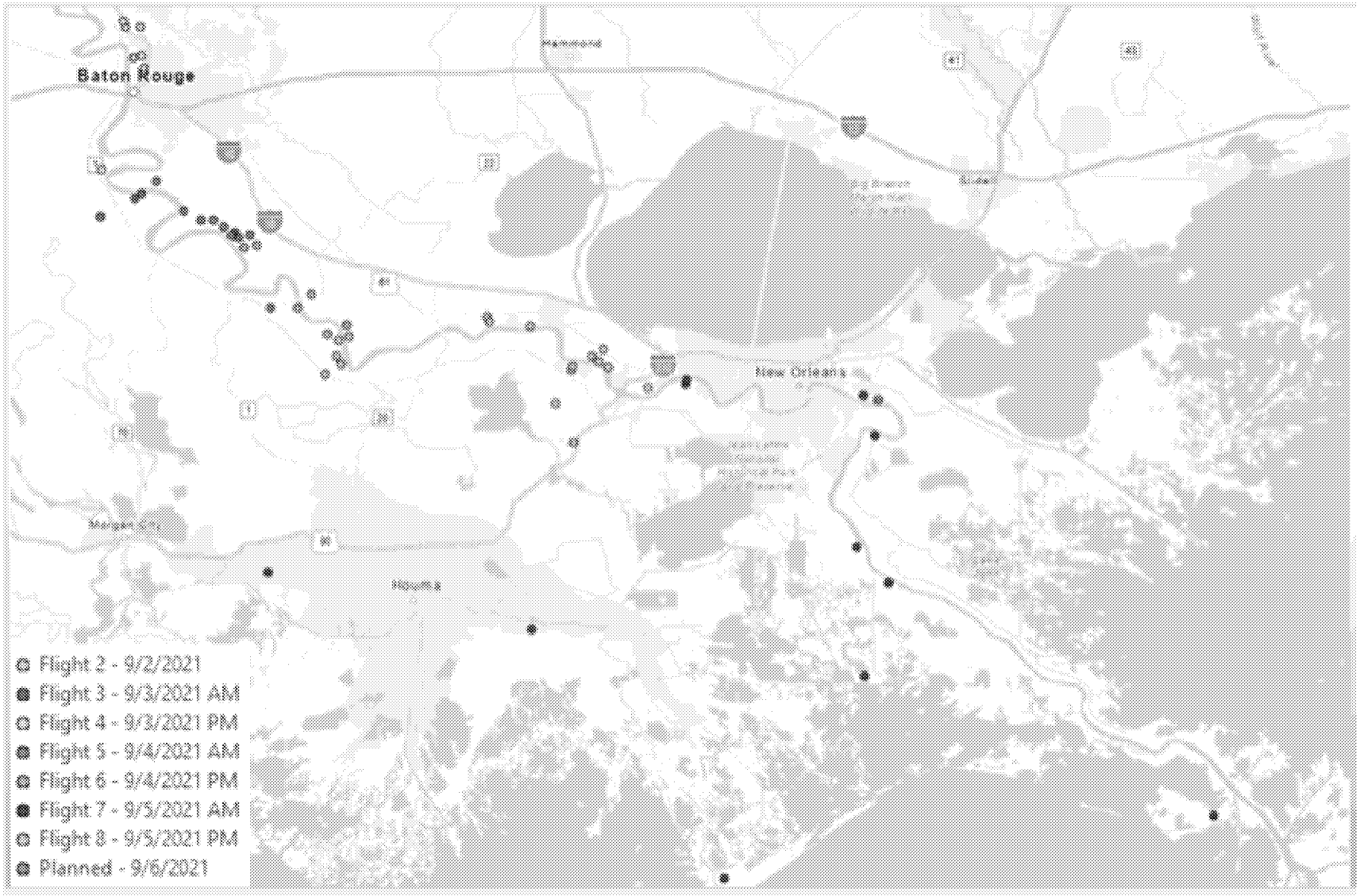
https://response.epa.gov/site/site_profile.aspx?site_id=1532

OEM-CMAD recently found the following press coverage of ASPECT and its activities:

https://apnews.com/article/business-environment-and-nature-oil-spills-b86c00b79c13613e08255384c27008d8

https://www.reuters.com/world/us/us-epa-r-after-ida-by-activating-special-aircraft-2021-09-03/

<image001.png>


Baton Rouge
New Orleans
Houma
Flight 2 - 9/2/2021
Flight 3 - 9/3/2021 AM
Flight 4 - 9/3/2021 PM
Flight 5 - 9/4/2021 AM
Flight 6 - 9/4/2021 PM
Flight 7 - 9/5/2021 AM
Flight 8 - 9/5/2021 PM
Planned - 9/6/2021

Message

From: Argenta, Edward [Argenta.Edward@epa.gov]
Sent: 9/7/2021 1:54:48 PM
To: McKown, Cody [cody.mckown@fema.dhs.gov]; Russell, Glen [glen.russell@fema.dhs.gov]; Mak, Morgan [morgan.mak@fema.dhs.gov]; Herr, Kevin N LT USCG SOUTHCOM JIATFS J2 (USA) [Kevin.N.Herr@uscg.mil]
CC: Honnellio, Anthony [Honnellio.Anthony@epa.gov]; Taylor, Jillianne [Taylor.Jillianne@epa.gov]; Pandey, Siddharth (CTR) [siddharth.pandey@associates.fema.dhs.gov]; Perovich, Gina [Perovich.Gina@epa.gov]; Jakabhazy, Elise [Jakabhazy.Elise@epa.gov]
Subject: EPA ASPECT Mission Plan for Hurricane Ida Response - 20210907
Attachments: FEMA_20210907_EPA_Ida_Response.pptx

All,

EPA ASPECT is inbound into the AOR. See the attached slide for details. We are targeting sites we only collected 1 data pass on to enhance our screening as well as additional targets of opportunity as we fly. If weather permits, we plan to hit the coastline first then go counterclockwise along the eastern shore -> NOLA -> Mississippi River -> BTR.

Thanks,
Ed

Edward Argenta Jr
Branch Chief
Field Operations Branch
CBRN Consequence Management Advisory Division
Office of Emergency Management
Argenta.edward@epa.gov
Gov't Mobile: 202.843.4511
Office #: 202.564.4528
Office: WJC-N - B517R

From: Argenta, Edward
Sent: Monday, September 6, 2021 9:01 AM
To: McKown, Cody <cody.mckown@fema.dhs.gov>; Russell, Glen <glen.russell@fema.dhs.gov>; Mak, Morgan <morgan.mak@fema.dhs.gov>; Herr, Kevin N LT USCG SOUTHCOM JIATFS J2 (USA) <Kevin.N.Herr@uscg.mil>
Cc: Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Taylor, Jillianne <Taylor.Jillianne@epa.gov>; Pandey, Siddharth (CTR) <siddharth.pandey@associates.fema.dhs.gov>; Perovich, Gina <Perovich.Gina@epa.gov>; Jakabhazy, Elise <Jakabhazy.Elise@epa.gov>
Subject: RE: EPA ASPECT Mission Plan for Hurricane Ida Response - 20210906

All,

EPA ASPECT has scrubbed their mission planned for 20210906 due to the storms in the area and the forecast for later in the afternoon. We are returning back to Home Base – Addison, TX for the day/evening. We are watching weather for tomorrow (09/07/2021) as Ops may be impacted again. We'll provide an update around 0730 CST on 20210907 of our plans for the day.

Please let me know if you have any questions,
Ed

Edward Argenta Jr
Branch Chief
Field Operations Branch

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Office of Emergency Management
Argenta.edward@epa.gov
Gov't Mobile: 202.843.4511
Office #: 202.564.4528
Office: WJC-N - B517R

From: Argenta, Edward
Sent: Monday, September 6, 2021 12:37 AM
To: McKown, Cody <cody.mckown@fema.dhs.gov>; Russell, Glen <glen.russell@fema.dhs.gov>; Mak, Morgan <morgan.mak@fema.dhs.gov>; Herr, Kevin N LT USCG SOUTHCOM JIATFS J2 (USA) <Kevin.N.Herr@uscg.mil>
Cc: R6 RRC <R6_RRC@epa.gov>; Delgado, Eric <Delgado.Eric@epa.gov>; Mekeel, Edward <mekeel.edward@epa.gov>; Fisher, Bray <fisher.kelsey@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Moore, Gary <moore.gary@epa.gov>; Taylor, Jillianne <Taylor.Jillianne@epa.gov>; Pandey, Siddharth (CTR) <siddharth.pandey@associates.fema.dhs.gov>; Perovich, Gina <Perovich.Gina@epa.gov>; Jakabhazy, Elise <Jakabhazy.Elise@epa.gov>
Subject: EPA ASPECT Mission Plan for Hurricane Ida Response - 20210906

All,

Please find the attached summary of EPA ASPECT activities as of 20210905 related to our support to the Hurricane Ida response. Please note, the slide has changed and we have symbolized the dates we performed our initial screening of the LDEQ& EPA priority facilities. EPA ASPECT has 1 site remaining on our POI list and plans to perform additional data collects on high priority facilities or additional POIs on 09/06/2021. Weather may impact our operations on 09/06/2021.

Respectfully,
Ed

Edward Argenta Jr
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CBRN Consequence Management Advisory Division
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Office #: 202.564.4528
Office: WJC-N - B517R

From: Argenta, Edward
Sent: Saturday, September 4, 2021 11:58 PM
To: 'McKown, Cody' <cody.mckown@fema.dhs.gov>; 'Russell, Glen' <glen.russell@fema.dhs.gov>
Cc: R6 RRC <R6_RRC@epa.gov>; Delgado, Eric <Delgado.Eric@epa.gov>; Mekeel, Edward <mekeel.edward@epa.gov>; Fisher, Bray <fisher.kelsey@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Moore, Gary <moore.gary@epa.gov>; Taylor, Jillianne <Taylor.Jillianne@epa.gov>; 'Pandey, Siddharth (CTR)' <siddharth.pandey@associates.fema.dhs.gov>; Perovich, Gina <Perovich.Gina@epa.gov>; Jakabhazy, Elise <Jakabhazy.Elise@epa.gov>
Subject: EPA ASPECT Mission Plan for Hurricane Ida Response - 20210905

Please see the attached summary slide for 9/4 execution and 9/5 plan. We successfully screened 19 locations on 9/4 and will attempt to get to ~25 sites on 9/5.

Thanks,
Ed

Edward Argenta Jr
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Office #: 202.564.4528
Office: WJC-N - B517R

From: Argenta, Edward
Sent: Friday, September 3, 2021 11:14 PM
To: McKown, Cody <cody.mckown@fema.dhs.gov>; Russell, Glen <glen.russell@fema.dhs.gov>
Cc: R6 RRC <R6_RRC@epa.gov>; Delgado, Eric <Delgado.Eric@epa.gov>; Mekeel, Edward <mekeel.edward@epa.gov>; Fisher, Bray <fisher.kelsey@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Moore, Gary <moore.gary@epa.gov>; Taylor, Jillianne <Taylor.Jillianne@epa.gov>; Pandey, Siddharth (CTR) <siddharth.pandey@associates.fema.dhs.gov>; Perovich, Gina <Perovich.Gina@epa.gov>
Subject: EPA ASPECT Mission Plan for Hurricane Ida Response - 20210904

Hi All,

Please find the attached slide which summarizes what we accomplished to date (black icons), our plan for 20210904 (blue icons), and the remaining facilities to screen (red/orange icons). You'll find our planned flight times and record of today's(20210903) flight hours. If you'd like this information in a different method/format or would benefit from a table of GPS locations for our planned activities please let me know.

Respectfully,
Ed

Edward Argenta Jr
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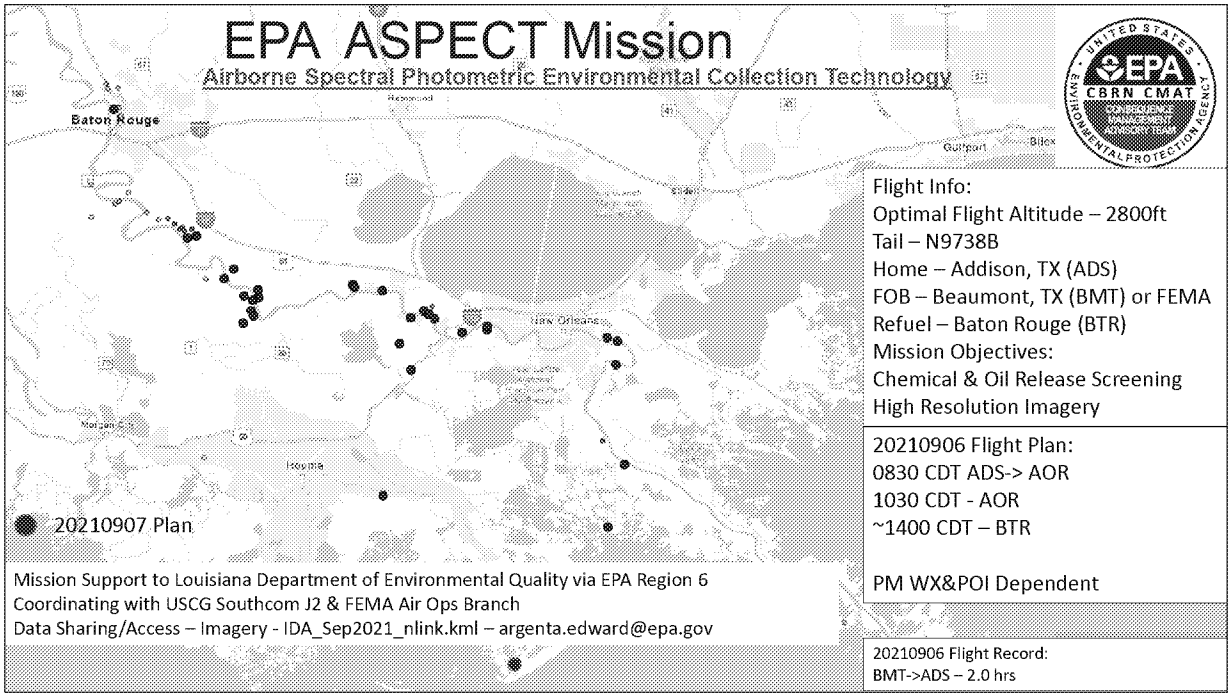
Office of Emergency Management
Argenta.edward@epa.gov
Gov't Mobile: 202.843.4511
Office #: 202.564.4528
Office: WJC-N - B517R



Cessna 208B Super Cargo Master Platform - Addison, TX
Range/Aloft Time: Range 1,200 NM; Aloft Time 4 – 6 hours

- An Infrared Line Scanner to image chemical plumes
- A High Speed Infrared Spectrometer to identify and quantify the composition of the chemical plume in the ppb to ppm range
- Gamma-Ray Spectrometer for radiation detection and isotope identification
- Neutron Detection System for enhanced radiological detection
- High resolution digital cameras (aerial & oblique) with ability to rectify for inclusion into GIS
- Broadband Satellite Data System (SatCom)

Message

From: Honnellio, Anthony [Honnellio.Anthony@epa.gov]
Sent: 9/7/2021 3:26:16 PM
To: Taylor, Jillianne [Taylor.Jillianne@epa.gov]
CC: Argenta, Edward [Argenta.Edward@epa.gov]
Subject: ASPECT Hurricane Ida QAPP attached
Attachments: QAPP-ASPECT- Hurricane IDA Sept 2021.docx

Hi Y'All,

QAPP attached and in Teams. Please let me know if I missed anything other than everything.

V/R,

Tony Honnellio
Health Physicist
EPA ASPECT (Detail)
5 Post Office Square, Suite 100
Boston, MA 02109-3912
W: 617 918-1456
C: 617 947-4414
F: 617 918-0456

Airborne
Spectral
Photometric
Environmental
Collection
Technology

2 September 2021

UFP-QAPP

Uniformed Federal Policy for
Quality Assurance Project Plans

ASPECT Air Quality Survey
Hurricane IDA

Jill Taylor
OEM / CMAD
Chemical/Photometric Lead
[HYPERLINK
"mailto:Taylor.Jillianne@EPA.g
ov"]
214-406-9896

Division Location:
Consequence Management Advisory Division

William Jefferson Clinton Building North1200
Pennsylvania Avenue, N.W Washington, DC
20460

Physical Location:
US EPA Region 6
Renaissance Tower
1201 Elm Street, 3rd Floor
Dallas, Texas

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Table of Contents

Acronyms, Abbreviations, and Definitions

AGL	Above Ground Level
ASPECT	Airborne Spectral Photometric Environmental Collection Technology
CMAD	Consequence Management Advisory Division, division within Office of Emergency Management
Flight #	Designates when a new flight has begun during the mission. Every time data is uploaded from the plane to the ground crew, a new flight number is given. This usually occurs at the end of the day—the next morning would have a new flight number—or mid-day when the plane is waiting for inclement weather to pass. The first flight number for the first flight of the mission is always #1 and increment after data has been uploaded.
FOB	Field Operations Branch, a branch within CMAD Division within the Office of Emergency Management
ft	feet
FTIR	Fourier Transform Infrared Spectrometer
FTP	File Transfer Protocol
IR	Infrared
IRLS	Infrared Line Scanner
Line #	Specific numbering system that corresponds to specific gps coordinates. Line numbers are assigned before the beginning of the first flight on the first day. Each line number can have multiple source names (e.g. facility names) within the line number—usually when facilities are close in a proximity to each other.
mph	miles per hour
MSIC	Digital photography file from the Imperx mapping camera
OEM	Office of Emergency Management
Pass #	Corresponds to the number of "passes" over the designated line. Each line could have multiple passes to capture the data. Example of factors affecting data during arun where another pass is warranted include clouds appearing under the plane, turbulence, gust of wind, inclement weather, etc.
ppm	parts per million
QAPP	Quality Assurance Project Plan
Run #	Numbering system for when the plane has flown over a line in chronological order for the day. For each flight the run number starts over with number "1" for each day or when the plane lands. Run numbers can be test flights, the initial run (i.e. Pass #1), or a re-pass of a line (i.e. Pass #2, #3,etc.)
RMD	Resources Management Division, division within the Office of Emergency Management
UFP-QAPP	Uniformed Federal Policy for Quality Assurance Project Plan

Introduction

Site Overview

Hurricane Ida made landfall at 11:55 AM CDT Sunday, August 30 as a high-end category-4 hurricane, with maximum sustained winds of 150 mph. The storm moved ashore near Port Fourchon, Louisiana after a period of rapid intensification, tying for the fifth strongest landfalling continental US hurricane on record with Hurricane Ida of 2020, among three other hurricanes. Severe wind and large-scale flood damage have been reported to property and infrastructure in much of southeast Louisiana, including significant damage in New Orleans, Louisiana. In addition, Ida has caused widespread damage across the Mid-Atlantic and Northeast US.

A variety of instruments on the ASPECT platform are used in providing situational awareness to the supported Region. These instruments can also identify and characterize both visible and non-visible plumes using an Infrared Line Scanner (IRLS). For more detailed chemical analysis, the Fourier Transform Infrared (FTIR) spectrometer is used to screen for the presence, location, and concentration of specific chemicals within ASPECT's automated 76 chemical detection library (Worksheet #15 outlines the various chemicals that can be detected using the FTIR spectrometer).In addition chemical sensing, the ASPECT plane can provide aerial photography using an oblique camera for taking photos from the view and position of the crew on the ASPECT plane, and a high speed photometric camera for taking high-resolution geo- rectified aerial photos from the bottom of the plane. Oblique and high-resolution cameras, the IRLS, and the FTIR will be used during the air quality screening flights for the Hurricane IDA mission.

Site Description, History & Background

The ASPECT aircraft was tasked to conduct a wide area air quality screening level assessment of areas populated with Risk Management Plan (RMP) sites and petrochemical facilities using the ASPECT system for detections of any airborne contaminants from ASPECT's 76 chemical detection library were detected in the areas between Beaumont, Houston, and Corpus Christi Texas. The Region wanted to know if any detections were found, the location of the detection, and the concentration detected.

The map of the of the area containing target facilities designated for survey in Southeastern LA can be seen in Figure 1 below.

Figure 1. Area where facilities are assessed.

Site Setup

Region 6 and LADEQ provided the ASPECT Team with a priority list of sites to be assessed in the AOC in order to focus the data collection efforts. GPS coordinates were determined, and specific GPS coordinates were provided to the aircraft. The size of the survey areas, weather and the distance between the areas influenced flight line planning. As a result, most properties were surveyed with one or two flight lines per area. Some larger facilities, or areas with multiple PRP's, may have had additional flight lines.

Title and Approval Page

QAPP Worksheet #1 (UFP-QAPP Manual Section 2.1)

Identifying Information
QAPP Worksheet #2 (UFP-QAPP Manual Section 2.2.4)

Site/Project Name: Hurricane Ida	
Site Number/Code:	
Operable Unit: EPA ASPECT Team	
Aerial Contractor Company Name: Airborne ASPECT	Technical Contractor Company Name: Kalman
Aerial Contract Title/Name: ARSS	Technical Contract Title/Name: DPDS
Aerial Contract Number: 68HERH21D0009	Technical Contract Number: GS-00F-343 CA

Quality Information Questions:

1. Identify guidance used to prepare QAPP: UFP-QAPP
2. Identify regulatory program: Comprehensive Environmental Response and Compensation Liability Act (CERCLA)
3. Identify approval entity: OEM / CMAD
4. Indicate type of QAPP: (check one) ☐ generic QAPP or ☒ project-specific QAPP
5. List dates of scoping sessions that were held: None
6. List dates and titles of QAPP documents written for previous site work, if applicable:

Title	Received Date
N/A	N/A

7. List organizational partners (stakeholders) and connection with lead organization: OEM/CMAD, Region 6
8. List data users: OEM/CMAD and Region 6
9. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion below:
   - Worksheet #9 – Due to the nature of an emergency response, a scoping meeting cannot be held in advance.
   - Worksheets # 12, 19-21, 23, 24-28, 30, 36 – Sampling and analytical activities are not expected to occur during this response.
   - Worksheet #37 – Usability of the data will be determined by R6

Streamlining Table for UFP-QAPP Format Requirements

Required QAPP Element(s) and Corresponding QAPP Section(s)	Crosswalk to Required Documents	Optional QAPP Worksheet # in QAPP Workbook	Required Information
Project Management and Objectives			
2.1 Title and Approval Page		1	- Title and Approval Page
2.2 Document Format and Table of Contents		N/A	- Table of Contents
2.2.1 Document Control Format		N/A	- Footer (bottom of each page)
2.2.2 Document Control Numbering System		N/A	- Footer (bottom of each page)
2.2.3 Table of Contents		N/A	- Table of Contents
2.2.4 QAPP Identifying Information		2	- QAPP Identifying Information
2.3 Distribution List and Project Personnel Sign-Off Sheet		3	- Distribution List
2.3.1 Distribution List		3	- Distribution List
2.3.2 Project Personnel Sign-Off Sheet		4	- Project Personnel Sign-Off Sheet
2.4 Project Organization			
2.4.1 Project Organizational Chart		5	- Project Organizational Chart
2.4.2 Communication Pathways		6	- Communication Pathways
2.4.3 Personnel Responsibilities and Qualifications		7	- Personnel Responsibilities and Qualifications Table
2.4.4 Special Training Requirements and Certification		8	- Special Personnel Training Requirements Table
2.5 Project Planning/Problem Definition		9	- Project Planning Session Documentation (including Data Needs tables)
2.5.1 Project Planning (Scoping)		9	- Project Scoping Session Participants Sheet
2.5.2 Problem Definition, Site History, and Background		10	- Problem Definition, Site History, and Background
		N/A	- Site Maps (historical and present)
2.6 Project Quality Objectives and Measurement Performance Criteria			
2.6.1 Development of Project Quality Objectives Using the Systematic Planning Process		11	- Site-Specific PQOs
2.6.2 Measurement Performance Criteria		12	- Measurement Performance Criteria Table

2.7 Secondary Data Evaluation		13 13	- Sources of Secondary Data and Information - Secondary Data Criteria and Limitations Table
2.8 Project Overview and Schedule 2.8.1 Project Overview 2.8.2 Project Schedule		14 15 16	- Summary of Project Tasks - Reference Limits and Evaluation Table - Project Schedule/Timeline Table
Measurement/Data Acquisition			
3.1 Sampling Tasks 3.1.1 Sampling Process Design and Rationale 3.1.2 Sampling Procedures and Requirements **3.1.2.1** Sampling Collection Procedures 3.1.2.2 Sample Containers, Volume, and Preservation 3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures 3.1.2.4 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures 3.1.2.5 Supply Inspection and Acceptance Procedures 3.1.2.6 Field Documentation Procedures		17 N/A 18 19 20 20 21 22	- Monitoring Design and Rationale - Monitoring Location Map - Monitoring Locations and Methods/ SOP Requirements Table - Analytical Methods/SOP Requirements Table - Field Quality Control Sample Summary Table - Sampling SOPs - Project Sampling SOP References Table - Field Equipment Calibration, Maintenance, Testing, and Inspection Table
3.2 Analytical Tasks 3.2.1 Analytical SOPs 3.2.2 Analytical Instrument Calibration Procedures 3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures 3.2.4 Analytical Supply Inspection and Acceptance Procedures		 23 23 24 25	 - Analytical SOPs - Analytical SOP References Table - Analytical Instrument Calibration Table - Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody		26 26 26 27	- Sample Collection Documentation Handling, Tracking, and Custody SOPs - Sample Container Identification - Sample Handling Flow Diagram Example Chain-of-Custody Form and Seal

Distribution List
QAPP Worksheet #3 (UFP-QAPP Manual Section 2.3.1)

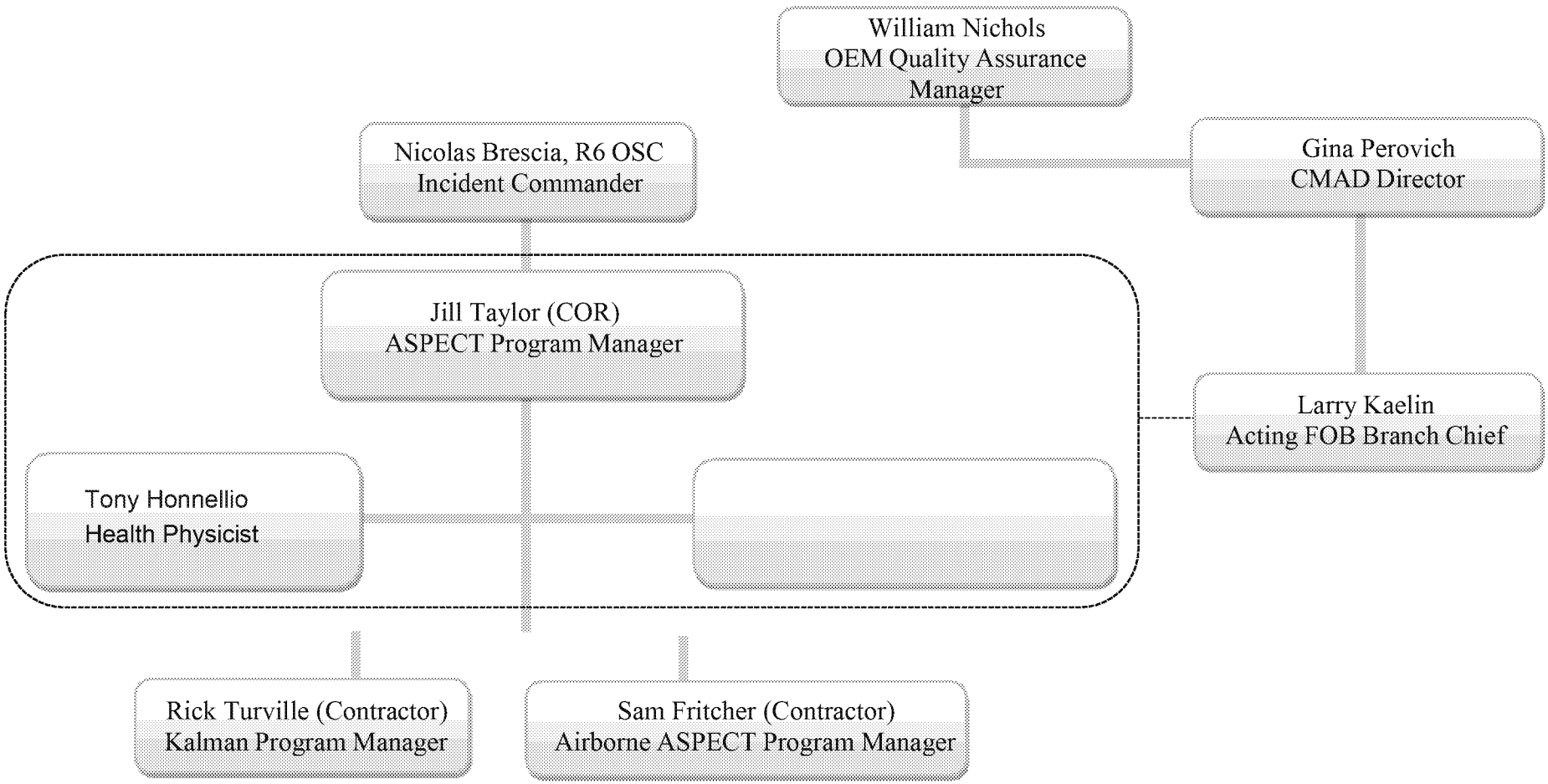
QAPP Recipients	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
Jill Taylor	ASPECT Chemical / Photometric Lead	OEM/CMAD/FOB	214-665-7545	N/A	[HYPERLINK "mailto:Taylor.Jillianne@epa.gov" \h]	QAPP-ASPECT-2SEPT2021-R01
Tony Honnellio	Health Physicist	EPA ASPECT (Detail)	617-918-1456	N/A	Honnellio.Anthony@epa.gov	QAPP-ASPECT-2SEPT2021-R01
Gina Perovich	CMAD Director	OEM/CMAD	202-564-2935	N/A	[HYPERLINK "mailto:Perovich.Gina@epa.gov" \h]	QAPP-ASPECT-2SEPT2021-R01
	OEM Branch Chief	OEM/CMAD		N/A		QAPP-ASPECT-2SEPT2021-R01
Edward Argenta Jr	Acting FOB Branch Chief	OEM/CMAD	202-564-4528	N/A	Argenta.edward@epa.gov	QAPP-ASPECT-2SEPT2021-R01
William Nichols	OEM Quality Assurance Manager	OEM/RMD	202-564-1970	N/A	[HYPERLINK "mailto:Nichols.Nick@epa.gov" \h]	QAPP-ASPECT-2SEP2021-R01

Project Personnel Sign-Off Sheet
QAPP Worksheet #4 (UFP-QAPP Manual Section 2.3.2)

Organization: OEM / CMAD / ASPECT

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
Jill Taylor	ASPECT Chemical Lead	214-665-7545	[HYPERLINK "mailto:Taylor.Jillianne@epa.gov" \h]	
William Nichols	OEM Quality Assurance Manager	202-564-1970	[HYPERLINK "mailto:Nichols.Nick@epa.gov" \h]	

Project Organizational Chart
QAPP Worksheet #5 (UFP-QAPP Manual Section 2.4.1)



Communication Pathways

QAPP Worksheet #6 (UFP-QAPP Manual Section 2.4.2)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (timing, pathways, etc.)
Approval of Initial QAPP and any amendments	Program Manager CMAD Director FOB Branch Chief OEM Quality Assurance Manager	Jill Taylor Gina Perovich Larry Kaelin William Nichols	214-665-7545 214-665-3143 202-564-2935 732-321-6625 202-564-1970	ASPECT Program internal peer review, followed by CMAD approval, implementation of changes effective only with approved QAPP or QAPP Change Form. QAPPs must be finalized 30 days after the response by OEM/CMAD Program.
Communication with Contracting Officer for approval, purchase request, and task orders	COR Alternate COR	Jill Taylor	214-665-6748 214-665-3143	For emergency responses, CO must give approval before being formally activated. Funding pathways and future funding needs must be estimated before commitments are agreed.
Communication with Pilot and Crew	Pidgin Grounds Operator (EPA) Pidgin Air Operator (ARSS) Pidgin Ground Operator (DPDS)	Tony Honnellio Sam Fritcher (Lead) Rick Turville (Lead)	617-918-1456 410-258-6281 540-287-3459	Communication from the ground to the plane must always be maintained during missions via Pidgin to communicate health and safety concerns, needs/changes of the mission, and confirmation of individual task status.
Briefings and De-briefings of Pilots and Crew	Program Manager Pidgin Grounds Operator (EPA) ARSS Program Manager Pilots Operators	Jill Taylor Tony Honnellio Sam Fritcher (Lead) Varies Varies	214-665-7545 617-918-1456 410-258-6281 Varies Varies	Before mission, morning briefings are conducted to go over the mission tasks for the day, discuss lessons learned from the previous day, go over flight expectations/ changes, review weather, and stress any/all health and safety concerns. De-briefings are conducted to review over the task completed for the day and any changes for the following day, if applicable.

Briefings and De-briefings with reach back team	Program Manager Health Physicist ARSS Program anager Subject Matter Experts	Jill Taylor Tony Honnellio Sam Fritcher Rick Turville (Lead) Varies Varies	214-665-7545 214-665-3143 410-258-6281 540-287-3459 Varies Varies	Briefings and discussions between the Government team and the reach back team concerning data collection standards and methods, sensor systems, fault analysis, and data quality.

Personnel Responsibilities and Qualifications Table
QAPP Worksheet #7 (UFP-QAPP Manual Section 2.4.3)

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
John Martin	Physical Scientist	US EPA/OEM/CMAD	Technical Direction	EPA job-related qualifications
Jill Taylor	Physical Scientist	US EPA OEM/CMAD	Technical Support (Lead)	EPA job-related qualifications
Lyndsey Nguyen	Health Physicist	US EPA OEM/CMAD	Technical Support	EPA job-related qualifications
Gina Perovich	Physical Scientist	US EPA OEM/CMAD	ASPECT Program Management/Support	EPA job-related qualifications
Larry Kaelin	Chemist	US EPA OEM/CMAD	ASPECT Program Management/Support	EPA job-related qualifications
William Nichols	Program Analyst	US EPA/OEM/RMD	OEM Quality Assurance Manager	EPA job-related qualifications
Sam Fritcher	ARSS Program Manager	ARSS/Airborne ASPECT	Lead Program Manager (Contractor)	Qualifications as listed in contract
Rick Turville	DPDS Program Manager	DPDS/Kalman	Lead Program Manager (Contractor)	Qualifications as listed in contract

Special Personnel Training Requirements Table

QAPP Worksheet #8 (UFP-QAPP Manual Section 2.4.4)

Project Function	Specialized Training By Title or Description of Course	Training Provider	Training Date	Personnel / Groups Receiving Training	Personnel Titles / Organizational Affiliation	Location of Training Records / Certificates
COR/Alternate COR	COR Level 2 Certification	FAITAS	2019 (recertification) 2020 (recertification)	John Martin Lyndsey Nguyen	COR Alternate COR	Online/In-person CLPs Online/In-person CLPs

Project Scoping Session Participants Sheet
QAPP Worksheet #9 (UFP-QAPP Manual Section 2.5.1)

Project Name: Projected Date(s) of Sampling: _____ Project Manager:	Site Name: Site Location:

Date of Session:
Scoping Session Purpose:

Name	Title	Affiliation	Phone #	E-mail Address	Project Role

N/A—Project Scoping Session was not conducted due to the project being an emergency response.

Comments/Decisions:

Action Items:

Consensus Decisions:

Problem Definition

QAPP Worksheet #10 (UFP-QAPP Manual Section 2.5.2)

The problem to be addressed by the project:
Hurricane Ida made landfall at 11:55 AM CDT Sunday, August 30 as a high-end category-4 hurricane, with maximum sustained winds of 150 mph. The storm moved ashore near Port Fourchon, Louisiana after a period of rapid intensification, tying for the fifth strongest landfalling continental US hurricane on record with Hurricane Ida of 2020, among three other hurricanes. Severe wind and large-scale flood damage have been reported to property and infrastructure in much of southeast Louisiana, including significant damage in New Orleans, Louisiana. In addition, Ida has caused widespread damage across the Mid-Atlantic and Northeast US. The advantage of deploying the ASPECT aircraft is to provide situational awareness to the Region/State/locals in a relatively short time while remotely determining if any detections from ASPECT's chemical library are present.

The environmental questions being asked:

- Would the RMP sites and air quality be affected by Hurricane IDA?
  -If so, are the ASPECT systems on the airplane detecting any of the 76 chemicals listed in ASPECT's chemical library? If so, where are the chemicals located (at which facility) and what is the estimated concentration for each chemical detected?

Observations from any site reconnaissance reports:
N/A—ASPECT was the first on the scene; no previous information was provided.

A synopsis of secondary data or information from site reports: N/A—no secondary data has been collected.

The possible classes of contaminants and the affected matrices: Gaseous chemical plumes from various manufacturing and petrochemical plants; potential chemicals of concern unknown, screening performed for all chemicals in the ASPECT auto-detect library.

The rationale for inclusion of chemical and nonchemical analyses:
The chemicals detected during flight are limited to the chemicals listed within ASPECT's 76 chemical library (See Table 1 below for complete list of chemicals in the library). No further analysis is conducted since ASPECT collects data remotely (no sampling occurs during flights nor does the airplane fly into the plume)

Problem Definition (continued)

QAPP Worksheet #10 (UFP-QAPP Manual Section 2.5.2)

Information concerning various environmental indicators:

The ASPECT plane can identify both visual and non-visual plumes and fires. While smoke is a great indication of a potential release, the ASPECT team relies more on the sensitive chemical sensors on board to make the ultimate determination of chemical detections.

Project decision conditions (If..., then...@ statements):

If a chemical is detected, the ASPECT Team will provide Region 6 with the data including the chemical name detected, the concentration, and location of the detection. While the ASPECT Team can make limited, general assumptions about the data (i.e. slightly elevated vs. extremely elevated values compared to the detection level), the ultimate decision for human health effects must come from Region 6, specifically the Region's toxicologists,risk assessors, and/or environmental unit.

Table 1. List of ASPECT's 76 Chemical Library for the FTIR Spectrometer
Detection Limits are posted in the parenthesis next to the chemical name in units of parts per million (ppm)

Acetic Acid (2.0)	Cumene (23.1)	Isoprene (6.5)	Phosphine (8.3)
Acetone (5.6)	Diborane (5.0)	Isopropanol (8.5)	Phosphorus Oxychloride (2.0)
Acrolein (8.8)	1,1-Dichloroethene (3.7)	Isopropyl Acetate (0.7)	Propyl Acetate (0.7)
Acrylonitrile (12.5)	Dichloromethane (6.0)	MAPP (3.7)	Propylene (3.7)
Acrylic Acid (3.3)	Dichlorodifluoromethane (0.7)	Methyl Acetate (1.0)	Propylene Oxide (6.8)
Allyl Alcohol (5.3)	1,1-Difluoroethane (0.8)	Methyl Acrylate (1.0)	Silicon Tetrafluoride (0.2)
Ammonia (2.0)	Difluoromethane (0.8)	Methyl Ethyl Ketone (7.5)	Sulfur Dioxide (15)
Arsine (18.7)	Ethanol (6.3)	Methanol (5.4)	Sulfur Hexafluoride (0.07)
Bis-Chloroethyl Ether (1.7)	Ethyl Acetate (0.8)	Methylbromide (60)	Sulfur Mustard (6.0)
Boron Tribromide (0.2)	Ethyl Acrylate (0.8)	Methylene Chloride (1.1)	Sulfuryl Fluoride (1.5)
Boron Triflouride (5.6)	Ethyl Formate (1.0)	Methyl Methacrylate (3.0)	Tetrachloroethylene (10)
1,3-Butadiene (5.0)	Ethylene (5.0)	MTEB (3.8)	1,1,1-Trichloroethane (1.9)
1-Butene (12.0)	Formic Acid (5.0)	Naphthalene (3.8)	Trichloroethylene (2.7)
2-Butene (18.8)	Freon 134a (0.8)	n-Butyl Acetate (3.8)	Trichloromethane (0.7)
Carbon Tetrachloride (0.2)	GA (Tabun) (0.7)	n-Butyl Alcohol (7.9)	Triethylamine (6.2)
Carbonyl Fluoride (0.8)	GB (Sarin) (0.5)	Nitric Acid (5.0)	Triethylphosphate (0.3)
Carbon Tetraflouride (0.1)	Germane (1.5)	Nitrogen Mustard (2.5)	Trimethylamine (9.3)
Chlorodifluoromethane (0.6)	Hexafluoroacetone (0.4)	Nitrogen Trifluoride (0.7)	Trimethyl Phosphite (0.4)
Chloromethane (12)	Isobutylene (15)	Phosgene (0.5)	Vinyl Acetate (0.6)

Quality Objectives/Systematic Planning Process Statements

QAPP Worksheet #11 (UFP-QAPP Manual Section 2.6.1) – Project

Who will use the data?
The data collected by ASPECT will be released to the Region through the Operations Branch to the Incident Commander. For smaller responses, direct communication with the designated, assigned OSC from the Region may occur. Once released from the response/incident/site, the data should be reviewed at a minimum by the Regional toxicologists, risk assessors, and/or environmental unit for determining exceedances for human health concerns, including residential and worker safety.

What will the data be used for?
The data may be incorporated into the response/site data for emergency response decision making purposes (e.g. identifying areas of concern, prioritizing resources, determining exceedances to human health and environmental impact guidelines).

What type of data are needed (matrix, target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques)?
The type of data collected by the ASPECT platform is called "remote sensing." No physical collection of material is conducted nor is the plane flying through areas of concern. Instead, the ASPECT plane can determine presence of specific chemicals from afar, without the need of sampling.

Matrix: No physical sample is collected; however, air is the matrix used for remote chemical detection.

How "good" do the data needs to be to support the environmental decision?
The ASPECT data sensitivity levels vary depending upon the chemical-specific detection limits for each chemical listed in ASPECT's chemical library. The concentrations in air would need to exceed the detection level for the specific chemicals to be detected.Once detected, the estimated concentration should be considered screening data for human health impact.

How much data are needed (number of samples for each analytical group, matrix, and concentration)?
The ASPECT chemical sensors screen for the presence of chemicals. Depending on the request, ASPECT can collect single data points or multiple data points. ASPECT collects chemical data at a rate of 70 samples (scans) per second. Typically, the ASPECT data is collected in "Lines" which contains information such as photometric images (oblique images as well as downward-looking images), as well as any chemical detections and/or the presence of a visible/non-visible plume. Lines are flown until the incident has been controlled or the scene has been adequately surveyed.

Project Quality Objectives/Systematic Planning Process Statements (continued)

QAPP Worksheet #11 (UFP-QAPP Manual Section 2.6.1)

Where, when, and how should the data be collected/generated?

Chemical data is typically collected at 2800 ft AGL at roughly 105 knots. While this is the optimal altitude and ground collection speed, lower altitudes including collection during rain events can be accomplished if necessary. Conditions have clouds within the field of view of the sensors should be avoided. Who will collect and generate the data?

The data is collected by the ASPECT Team utilizing two separate contractors:

1. ARSS Contract (also known as Airborne ASPECT) oversees the plane, pilots, and crew. Each mission consists of 2 pilots and 1 operator. The operator is in constant communication with the ground crew and the pilot. The operator is ASPECT's eyes and ears in the air. He/she lets the ground crew know of any changes, obstacles, weather conditions, and/or health and safety concerns during the mission.
2. DPDS Contract (also known as Kalman) oversees the data collection. Data from the plane is pushed through the satellite communications system to the ground-based crew. The ground crew processes the data to create various maps, graphs, and photos used for the incident command. All detections of chemicals are verified by pulling the specific spectrum to observe the peaks. The data can come in a variety of different formats. EPA personnel work with the Regional Data Managers to generate data products into specific formats needed.

How will the data be reported?

The data is reported in a variety of different ways and formats throughout the response. The ASPECT Team will coordinate with the Regional Data Managers to determine the best way to transfer the data as the data is collected. At a minimum, the Region will receive a "Final Report" in roughly a day after the response is concluded. In addition, an FTP site will be created for all the files. During the response, pictures, graphs, and figures can be sent to the Region to give a better situational awareness of the incident. Any detections, including the location, chemical name, and concentration, will be sent via email with a follow-up phone call from the Program Manager to the Operations Chief, IC, or designated point-of-contact explaining the detection.

How will the data be archived?

All data will be maintained on a project specific FTP site temporarily; then the data will be stored on the ASPECT server for long term recovery. No files will ever be deleted.

Measurement Performance Criteria Table
QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2)

Matrix	Air
Analytical Group	Varies
Concentration Level	Varies

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and / or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A), Imagery (I), Flight (F)
FTIR	N/A	False Alarm Detections	Pattern Recognition algorithm compares the acquired spectrum against 76 chemical libraries for detections. Non-detections in controlled settings indicate proper spectrometer operation.	Spectroscopist manually checks the chemical identified by the pattern recognition algorithm to individual spectrums. This is a secondary confirmation of the proper spectrometer operation	A
IRLS	N/A	Typical imagery data content. Saturation/Halo affect Image registration	Analysis of data shows high values for elevated temperature targets and low values for cold targets. Flying over fires/hot spots should saturate the IRLS—rainbow affect will occur on image. Visually ensure images from IRLS are in georegistered against	Image data will be checked for content as related to the flanking blackbody settings. Images will be checked to ensure saturation occurs during fire/extreme temperature hot spots. Flight parameters are checked for pitch, roll, heading, velocity, and	I / F

			known maps datums. with little warping/distortion of the image occurring	speed to maximize the best quality in IRLS imagery	

Secondary Data Criteria and Limitations Table

QAPP Worksheet #13 (UFP-QAPP Manual Section 2.7)

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation / collection dates)	How Data Will Be Used	Limitations on Data Use
	N/A—No secondary data is pulled into the ASPECT System.			

Summary of Project Tasks

QAPP Worksheet #14 (UFP-QAPP Manual Section 2.8.1)

Monitoring Tasks:
ASPECT has been tasked to fly over facilities locations provided by Region 6. Depending on the size of the facility, at least one line will be flown to gather data for determining if any chemicals are being detected from ASPECT's 76 automated chemical library. A minimum of one photo will be taken over each facility.

Analysis Tasks:
(1) The Infrared Line Scanner (IRLS) will be used to qualitatively locate and characterize any visible and non-visible components of a plume, as well as any areas on fire.
(2) The Fourier Transform Infrared (FTIR) Spectrometer will be used to screen for the presence and location of specific chemicals within ASPECT's automated chemical detection library.

Quality Control Tasks:
Before each mission, a test line is conducted to ensure the chemical detection and photographic systems are working properly.

Secondary Data:
N/A—no secondary data is used for collecting primary data from ASPECT.

Other Data:
N/A

Data Management Tasks:
Data is managed on a project-specific FTP site accessible by the Region at any time throughout the response. The site address, FTP site name, and password will be provided to the designated data OSC requesting information.

Documentation and Records:
Temporarily, the site-specific FTP is used as storage for all data. After the response, the Project FTP site is deleted. All permanent files from the response are housed on the ASPECT server.

Assessment / Audit Tasks
The quality of data and reporting is assessed using informal peer reviews and management reviews. Peer review enables the field personnel, of the ASPECT Team, as well as the Regions, to identify and correct reporting errors before reports are submitted. Management reviews final reports before data and the reports are released to the customer. Management review ensuresboth data and reports are compliant with prevailing management structure, policies, and procedures, and ensures that the data reported is not misrepresented nor misinterpreted for its initial intent.

Data Review Tasks:
All ASPECT deliverables will be reviewed by the ASPECT Government Team. Final drafts of reports are reviewed by Management before they are released outside of CMAD.

Reference Limits and Evaluation Table
QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1)

Matrix: Air (remote sensing)
Analytical Group: Chemical Compounds
Concentration Level: Varies depending on the chemical

	Analyte	CAS Number	Project Action Limit* (ppm)	Project Quantitation Limit Goal** (ppm)	Analytical Method		Achievable Laboratory Limits	
					MDLs	Method QLs	MDLs	QLs
1.	Acetic Acid	64-19-7		2.0				
2.	Acetone	67-64-1		5.6				
3.	Acrolein	107-02-8		8.8				
4.	Acrylonitrile	107-13-1		12.5				
5.	Acrylic Acid	79-10-7		3.3				
6.	Allyl Alcohol	107-18-6		5.3				
7.	Ammonia	7664-41-7		2.0				
8.	Arsine	7784-42-1		18.7				
9.	Bis-Chloroethyl Ether	111-44-4		1.7				
10.	Boron Tribromide	10294-33-4		0.2				
11.	Boron Triflouride	7637-07-2		5.6				
12.	1,3-Butadiene	106-99-0		5.0				
13.	1-Butene	106-98-9		12.0				
14.	2-Butene	107-01-7		18.8				
15.	Carbon Tetrachloride	56-23-5		0.2				

Project Action Limits will be specified by the Region's Risk Assessor / Toxicologist

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Reference Limits and Evaluation Table (continued)
QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1)

	Analyte	CAS Number	Project Action Limit* (ppm)	Project Quantitation Limit Goal** (ppm)	Analytical Method		Achievable Laboratory Limits	
					MDLs	Method QLs	MDLs	QLs
16.	Carbonyl Fluoride	353-50-4		0.8				
17.	Carbon Tetraflouride	75-73-0		0.1				
18.	Chlorodifluoromethane	75-45-6		0.6				
19.	Chloromethane	74-87-3		12				
20.	Cumene	98-82-8		23.1				
21.	Diborane	19287-45-7		5.0				
22.	1,1-Dichloroethene	75-35-4		3.7				
23.	Dichloromethane	75-09-2	Project Action Limits will be specified by the Region's Risk Assessor / Toxicologist	6.0				
24.	Dichlorodifluoromethane	75-71-8		0.7				
25.	1,1-Difluoroethane	75-37-6		0.8				
26.	Difluoromethane	75-10-5		0.8				
27.	Ethanol	64-17-5		6.3				
28.	Ethyl Acetate	141-78-6		0.8				
29.	Ethyl Acrylate	140-88-5		0.8				
30.	Ethyl Formate	109-94-4		1.0				
31.	Ethylene	74-85-1		5.0				
32.	Formic Acid	64-18-6		5.0				
33.	Freon 134a	811-97-2		0.8				
34.	GA (Tabun)	77-81-6		0.7				
35.	GB (Sarin)	107-44-8		0.5				
36.	Germane	7782-65-2		1.5				
37.	Hexafluoroacetone	684-16-2		0.4				

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Reference Limits and Evaluation Table (continued)
QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1)

	Analyte	CAS Number	Project Action Limit* (ppm)	Project Quantitation Limit Goal** (ppm)	Analytical Method		Achievable Laboratory Limits	
					MDLs	Method QLs	MDLs	QLs
38.	Isobutylene	115-11-7		15				
39.	Isoprene	78-79-5		6.5				
40.	Isopropanol	67-63-0		8.5				
41.	Isopropyl Acetate	108-21-4		0.7				
42.	MAPP	143492-38-0		3.7				
43.	Methyl Acetate	79-20-9		1.0				
44.	Methyl Acrylate	96-33-3		1.0				
45.	Methyl Ethyl Ketone	78-93-3		7.5				
46.	Methanol	67-56-1		5.4				
47.	Methyl bromide	74-83-9		60				
48.	Methylene Chloride	75-09-20		1.1				
49.	Methyl Methacrylate	80-62-6		3.0				
50.	MTEB	1634-04-4		3.8				
51.	Naphthalene	91-20-3		3.8				
52.	n-Butyl Acetate	123-86-4		3.8				
53.	n-Butyl Alcohol	71-36-3		7.9				
54.	Nitric Acid	7697-37-2		5.0				
55.	Nitrogen Mustard	51-75-2		2.5				
56.	Nitrogen Trifluoride	7783-54-2		0.7				
57.	Phosgene	75-44-5		0.5				
58.	Phosphine	7803-51-2		8.3				

Project Action Limits will be specified by the Region's Risk Assessor / Toxicologist

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Reference Limits and Evaluation Table (continued)
QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1)

	Analyte	CAS Number	Project Action Limit* (ppm)	Project Quantitation Limit Goal** (ppm)	Analytical Method		Achievable Laboratory Limits	
					MDLs	Method QLs	MDLs	QLs
59.	Phosphorus Oxychloride	10025-87-3		2.0				
60.	Propyl Acetate	109-60-4		0.7				
61.	Propylene	115-07-1		3.7				
62.	Propylene Oxide	75-56-9		6.8				
63.	Silicon Tetrafluoride	7783-61-1		0.2				
64.	Sulfur Dioxide	7446-09-5	Project Action Limits will be specified by the Region's Risk Assessor / Toxicologist	15				
65.	Sulfur Hexafluoride	2551-62-4		0.07				
66.	Sulfur Mustard	505-60-2		6.0				
67.	Sulfuryl Fluoride	2699-79-8		1.5				
68.	Tetrachloroethylene	127-18-4		10				
69.	1,1,1-Trichloroethane	71-55-6		1.9				
70.	Trichloroethylene	156-60-5 (E)		2.7				
71.	Trichloromethane	67-66-3		0.7				
72.	Triethylamine	121-44-8		6.2				
73.	Triethylphosphate	78-40-0		0.3				
74.	Trimethylamine	75-50-3		9.3				
75.	Trimethyl Phosphite	121-45-9		0.4				
76.	Vinyl Acetate	108-05-4		0.6				

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

* represents the screening value used for notifying the Region. The values in this column are from the Texas Commission on Environmental Quality (TCEQ) short-term Air Monitoring Comparison Values (AMCVs)
**represents the minimum detectable concentration for ASPECT to flag the chemical as a "detect" based on a 100 meter pathlength

Project Schedule / Timeline Table
QAPP Worksheet #16 (UFP-QAPP Manual Section 2.8.2)

Activities	Organization	Dates (DD Month YYYY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Initial Activation for Mission	Region 6	27 AUGUST 2020	31 AUGUST 2020	Photometric / Chemical Data	Preliminary Data, ASAP with follow-up reports/briefs (internal)
Property Assessments Day 1	US EPA/OEM/CMAD	28 AUGUST 2020	28 AUGUST 2020	Draft Report	29 AUGUST 2020
Property Assessments Day 1	US EPA/OEM/CMAD	28 AUGUST 2020	28 AUGUST 2020	All Files: Day 1	29 AUGUST 2020
Property Assessments Day 2	US EPA/OEM/CMAD	29 AUGUST 2020	29 AUGUST 2020	Draft Report	30 AUGUST 2020
Property Assessments Day 2	US EPA/OEM/CMAD	29 AUGUST 2020	29 AUGUST 2020	All Files: Days 1-2	30 AUGUST 2020
Property Assessments Total	US EPA/OEM/CMAD	28 AUGUST 2020	30 AUGUST 2020	Final Report	31 AUGUST 2020
Property Assessments Total	US EPA/OEM/CMAD	28 AUGUST 2020	30 AUGUST 2020	All Files	31 AUGUST 2020
External Reporting for R6 Publication for Public Info	US EPA/OEM/CMAD	28 AUGUST 2020	6 SEPT 2020	External Report	6 SEPT 2020

Monitoring Design and Rationale

QAPP Worksheet #17 (UFP-QAPP Manual Section 3.1.1)

Describe and provide a rationale for choosing the Monitoring approach (e.g., grid system, biased statistical approach):
List of properties with GPS Coordinates was provided to ASPECT Team from Region 6.
A map of the facilities geo-referenced onto a map was created through Google Earth.
Flight lines are numbered sequentially based on the location of the area to be surveyed.
Each day new flight line numbers will be flown to assess each property for any plumes, fires, and/or detections over the areas.
Data, including any observances or detections, will be relayed back to the Region for situational awareness.
Pilots will inform aircraft operators to report to ground control team if any weather issues occur or seen from the aircraft, and if any health and safety concerns arise during flight.
Tracking of flight lines will be conducted by both the operator and ground control.
Constant communication between the operator and ground control must be always maintained.
When all lines are complete, the mission has ended. ASPECT Team will contact the Region when mission is complete for further instruction.

Describe the sampling design and rationale in terms of what matrices will be sampled, what analytical groups will and at what concentration levels, the sampling locations (including QC, critical, and background samples), the number of samples to be taken, and the sampling frequency (including seasonal considerations) [May refer to map or Worksheet #18 for details]:
Photometric images will be collected for each flight line.
Air will be monitored for the chemical compounds listed in ASPECT's 76 chemical library using the FTIR.
Any plumes/smoke will be imaged and assessed while airborne using the IRLS.
Each line is geographically located to optimize the best flight paths in the least amount of time.
Flight lines are uploaded to the pilot's Garmin remotely.

Sampling Locations and Methods/SOP Requirements Table
QAPP Worksheet #18 (UFP-QAPP Manual Section 3.1.1)

Sampling Location / ID Number	Matrix	Altitude AGL (feet)	Analytical Group	Concentration Level	Number of Samples	Sampling SOP Reference	Rationale for Sampling Location
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern

Sampling Location / ID Number	Matrix	Altitude AGL (feet)	Analytical Group	Concentration Level	Number of Samples	Sampling SOP Reference	Rationale for Sampling Location
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern

Sampling Location / ID Number	Matrix	Altitude AGL (feet)	Analytical Group	Concentration Level	Number of Samples	Sampling SOP Reference	Rationale for Sampling Location
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern
	Air Space on designated flight line	2800 ft (ideal but depends on weather)	ALL	Varies	Minimum: 1 photo, 1 IRLS, 1 FTIR	N/A	Facility of Concern

Analytical SOP Requirements Table

QAPP Worksheet #19 (UFP-QAPP Manual Section 3.1.1)

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method / SOP Reference	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation / analysis)

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Field Quality Control Sample Summary Table
QAPP Worksheet #20 (UFP-QAPP Manual Section 3.1.1)

Matrix	Analytical Group	Conc. Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of MS	No. of Field Blanks	No. of Equip. Blanks	No. of PT Samples	Total No. of Samples to Lab

N/A—No field sampling nor collection of air is conducted during the ASPECT mission.

Project Sampling SOP References Table
QAPP Worksheet #21 (UFP-QAPP Manual Section 3.1.2)

Reference Number	Title, Revision Date and / or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Field Equipment Calibration, Maintenance, Testing, and Inspection Table

QAPP Worksheet #22 (UFP-QAPP Manual Section 3.1.2.4)

Field Equipment	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference
FTIR	Annual checks are performed as needed	As needed, typically software upgrades	Monthly Readiness Checks / Pre-Flight Testing	Identifying blue light turns on to ensure internal checks complete	Monthly / On missions	System turns ON without error/alarm	ASPECT Team must be contacted for further action	Operator, ARSS	N/A
IRLS	Annual checks are performed as needed	As needed, typically software upgrades	Monthly Readiness Checks / Pre-Flight Testing	Identifying red light turns on to ensure internal checks complete	Monthly / On missions	System turns ON without error/alarm	ASPECT Team must be contacted for further action	Operator, ARSS	N/A
MSIC	N/A	As needed, typically software upgrades	Monthly Readiness Checks / Weekly Systems Check / Pre-Flight Testing	Ensure powered-up correctly	Monthly / Weekly / On missions	System turns ON without error/alarm	ASPECT Team must be contacted for further action	Operator, ARSS	N/A
Oblique	N/A	As needed, typically software upgrades	Monthly Readiness Checks / Weekly Systems Check / Pre-Flight Testing	Ensure powered-up correctly	Monthly / Weekly / On missions	System turns ON without error/alarm	ASPECT Team must be contacted for further action	Operator, ARSS	N/A

Analytical SOP References Table
QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1)

Reference Number	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Analytical Instrument Calibration Table
QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2)

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference

N/A—Due to the physical location of our instruments mounted on the plane, the instruments cannot be calibrated.
The instruments perform internal checks to calibrate itself prior to each mission, at a minimum.

Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table
QAPP Worksheet #25 (UFP-QAPP Manual Section 3.2.3)

Instrument / Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference

N/A—No analytical instrumentation and equipment are part of the ASPECT suite of sensors/detectors.

Sample Handling System
QAPP Worksheet #26 (UFP-QAPP Manual Appendix A)

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization):
Sample Packaging (Personnel/Organization):
Coordination of Shipment (Personnel/Organization):
Type of Shipment/Carrier: N/A—No sampling nor collection of air is conducted during the ASPECT mission.
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization):
Sample Custody and Storage (Personnel/Organization):
Sample Preparation (Personnel/Organization):
Sample Determinative Analysis (Personnel/Organization):
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection):
Sample Extract/Digestate Storage (No. of days from extraction/digestion):
Biological Sample Storage (No. of days from sample collection):
SAMPLE DISPOSAL
Personnel/Organization:
Number of Days from Analysis:

Sample Custody Requirements Table

QAPP Worksheet #27 (UFP-QAPP Manual Section 3.3.3)

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory):

Laboratory Sample Custody Procedures (receipt of samples, archiving, disposal):

Sample Identification Procedures:

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Chain-of-custody Procedures:

QC Samples Table
QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4)

Matrix	
Analytical Group	
Concentration Level	
Sampling SOP	
Analytical Method / SOP Reference	
Sampler's Name	
Field Sampling Organization	
Analytical Organization	
Number of Sample Locations	

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Equip blank						
MS (Lab QC)						
Field Duplicate						
LFB (QL)						

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Project Documents and Records Table
QAPP Worksheet #29 (UFP-QAPP Manual Section 3.5.1)

Sample/Monitoring Collection Documents and Records	On-Site/In-Air Analysis Documents and/or Records	Off-Site/Ground Analysis Documents and/or Records	Data Assessment Documents and Records	Other
MSIC Data Files	Yes—compressed version of files	Yes—full data files are received and assessed	Visually scanned for obstacles/limitations in the pictures (e.g., clouds, lack of light)	N/A
FTIR Data Files	Yes—detections only files are pulled	Yes—full data files are received and assessed	For all detects, data spectrums for the hit are assess/verified. Graphs showing the spectrum is provided in the Final Report.	N/A
IRLS Data Files	Yes—compressed version of files only	Yes—full data files are received and assessed	Visual products are created. Data is assessed during flight to optimize all parameters: pitch, roll, and heading of the plane, as well as velocity and height of the plane	N/A

Analytical Services Table
QAPP Worksheet #30 (UFP-QAPP Manual Section 3.5.2.3)

Matrix	Analytical Group	Concentration Level	Sample Locations/ID Number	Analytical SOP	Data Package Turnaround Time	Laboratory / Organization (name and address, contact person and telephone number)	Backup Laboratory / Organization (name and address, contact person and telephone number)

N/A—No sampling nor collection of air is conducted during the ASPECT mission.

Planned Project Assessments Table
QAPP Worksheet #31 (UFP-QAPP Manual Section 4.1.1)

Assessment Type	**Frequency**	**Internal or External**	**Organization Performing Assessment**	**Person(s) Responsible for Performing Assessment** (title and organizational affiliation)	**Person(s) Responsible for Responding to Assessment Findings** (title and organizational affiliation)	**Person(s) Responsible for Identifying and Implementing Corrective Actions (CA)** (title and organizational affiliation)	**Person(s) Responsible for Monitoring Effectiveness of CA** (title and organizational affiliation)
MSIC images	Each Line	Internal	DPDS Contractor	Brian Dess, DPDS	Mark Thomas, DPDS Jill Taylor, EPA	Mark Thomas, DPDS Jill Taylor, EPA	Mark Thomas, DPDS Jill Taylor, EPA
Oblique Images	Each Line	Internal	DPDS Contractor	Brian Dess, DPDS	Mark Thomas, DPDS Jill Taylor, EPA	Mark Thomas, DPDS Jill Taylor, EPA	Mark Thomas, DPDS Jill Taylor, EPA
FTIR Data detections	Only on detections	Internal	DPDS Contractor	Robert Kroutil, DPDS	Robert Kroutil, DPDS Jill Taylor, EPA	Robert Kroutil, DPDS Jill Taylor, EPA	Robert Kroutil, DPDS Jill Taylor, EPA
IRLS images	Each Line	Internal	DPDS Contractor	Robert Kroutil, DPDS	Robert Kroutil, DPDS Jill Taylor, EPA	Robert Kroutil, DPDS Jill Taylor, EPA	Robert Kroutil, DPDS Jill Taylor, EPA

Assessment Findings and Corrective Action Responses
QAPP Worksheet #32 (UFP-QAPP Manual Section 4.1.2)

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response	Timeframe for Response
MSIC images	Image File Quality	Jill Taylor, EPA Chemical and Photometric Lead	Immediately, post processing	Any corrective actions of re-flying the line is documented in Pidgin	ARSS Operator in the plane to communicate with pilot	Immediately
Oblique Images	Image File Quality	Jill Taylor, EPA Chemical and Photometric Lead	Immediately, post processing	Any corrective actions of re-flying the line is documented in Pidgin	ARSS Operator in the plane to communicate with pilot	Immediately
FTIR Data detections	FTIR Spectrum File	Jill Taylor, EPA Chemical and Photometric Lead	Immediately, post processing	Any corrective actions of re-flying the line is documented in Pidgin	ARSS Operator in the plane to communicate with pilot	Immediately
IRLS images	Image File Quality	Jill Taylor, EPA Chemical and Photometric Lead	Immediately, post processing	Any corrective actions of re-flying the line is documented in Pidgin	ARSS Operator in the plane to communicate with pilot	Immediately

QA Management Reports Table

QAPP Worksheet #33 (UFP QAPP Manual Section 4.2)

Type of Report	Frequency (daily, weekly monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (title and organizational affiliation)	Report Recipient(s) (title and organizational affiliation)
Brief Report	If needed, once per day of the response mission / site / incident	Within the same day	John Martin, EPA Jill Taylor, EPA Lyndsey Nguyen, EPA	Region 6 Lead OSC Region 6 Manager CMAD Management
Draft Report	One per day of the response mission / site / incident	Within 24 hours after response concluded.	John Martin, EPA Jill Taylor, EPA Lyndsey Nguyen, EPA	Region 6 Lead OSC Region 6 Manager CMAD Management
Final Report	One per response mission / site / incident	Within 24 hours after Draft Report comments.	John Martin, EPA Jill Taylor, EPA Lyndsey Nguyen, EPA	Region 6 Lead OSC Region 6 Manager CMAD Management
QAPP	One per response mission / site / incident	30 Days from initial day of response	John Martin, EPA Jill Taylor, EPA Lyndsey Nguyen, EPA	Region 6 Lead OSC Region 6 EU CMAD Management

Verification (Step I) Process Table
QAPP Worksheet #34 (UFP-QAPP Manual Section 5.2.1)

Verification Input	Description	Internal / External	Responsible for Verification (name, organization)
FTIR Operational	Blue light verification—verifying the internal checks successfully completed (Zero Phase Displacement check is synced with the LASER)	Internal	Operator--Jimmy Crisp, ARSS
IRLS Operational	Red Light verification—verifying the internal checks successfully completed (prism angular velocity check, temperature check, and resolution check)	Internal	Operator--Jimmy Crisp, ARSS
MSIC Operational	Power-up verification to ensure internal communications are operating correctly	Internal	Operator--Jimmy Crisp, ARSS
Oblique Operational	Verify start up is working correctly	Internal	Operator--Jimmy Crisp, ARSS
MSIC Image Quality	When data is processed on the plane, the data is pulled through the satellite to the ground crew. The data is this looked at for quality of the image. Geospatial assessment of orthorectification is conducted.	External	Brian Dess, DPDS
Oblique Image Quality	When data is processed on the plane, the data is pulled through the satellite to the ground crew. The data is this looked at for quality of the image.	External	Brian Dess, DPDS
FTIR Spectrums	When data is processed on the plane, the data is pulled through the satellite to the ground crew. The data is then looked at spectrally at the absorption peaks. The chemical identified is compared to the images and site conditions to determine if the chemical detected makes sense for the situation. Chemical identified and concentrations are coordinated to the Region. Comparison of ground detection vs. air detections is conducted for decision making purposes.	External	Robert Kroutil, DPDS
IRLS Images Quality	When data is processed on the plane, the data is pulled through the satellite to the ground crew. The data is this looked at for quality of the image including IR content and geospatial registration	External	Dave Miller, DPDS

Validation (Steps IIa and IIb) Process Table
QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2) --

Step IIa / IIb	Validation Input	Description	Responsible for Validation (name, organization)
IIb	Laboratory Initial Checks	Equipment is checked before installation on plane	Mark Thomas, Kalman Robert Kroutil, Kalman
IIb	FTIR Post-Data Collection	Manual "spot verification" from the spectroscopist to validate detections by algorithm (i.e. pattern recognition) and natural background features	Mark Thomas, Kalman Robert Kroutil, Kalman
IIb	IRLS	Visual Image quality inspection by spectroscopist	Mark Thomas, Kalman Robert Kroutil, Kalman
IIb	MSIC	Images are geo-rectified and plotted onto Google Earth to visually verify images are positioned correctly	Brian Dess, Kalman

Validation (Steps IIa and IIb) Summary Table

QAPP Worksheet #36 (UFP-QAPP Manual Section 5.2.2)

Step IIa / IIb	Matrix being Analyzed	Type of Parameter	Parameters	Validation Criteria	Data Validator (title and organizational affiliation)
IIa	Column of Air	Orientation of sensor	Total Pitch	Less than 6 degrees	Dave Miller, Kalman
IIa	Column of Air	Orientation of sensor	Pitch Deviation	Less than 10 mrads/sec	Dave Miller, Kalman
IIa	Column of Air	Orientation of sensor	Roll	Less than 5 degrees	Dave Miller, Kalman
IIa	Column of Air	Orientation of sensor	Heading	Less than 5 degrees	Dave Miller, Kalman
IIa	Column of Air	Orientation of sensor	Altitude	2800 feet +/- 100 ft	Dave Miller, Kalman
IIa	Column of Air	Orientation of sensor	Velocity	110 knots +/- 5 knots	Dave Miller, Kalman

Usability Assessment

QAPP Worksheet #37 (UFP-QAPP Manual Section 5.2.3)

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:
ASPECT will work with the OSC/customer to determine if data of known and documented quality are fit for their intended use. The OSC/customer will be notified of any limitations of the usability of the data. The customer will determine the "usability" of the information provided.

No formal usability assessment is performed; however, an in-house data review is performed to ensure that data have been calculated, recorded and transmitted correctly. Examples include checking for transcription and calculation errors.
Data will undergo an analyst review and a peer review prior to submission to the EPA.

ASPECT collects screening data only and will not undergo the standard internal reviews and validation required by the Quality Management Plan. Once passed to EPA, the results of the analysis may be validated by Regional QA managers or third-party staff using their validation processes.

Describe the evaluative procedures used to assess overall measurement error associated with the project:
N/A

Identify the personnel responsible for performing the usability assessment:
EPA OSC/customer determines the usability based upon us informing them of the limitations and caveats of the techniques

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:
N/A—usability is determined by the OSC/customer

Appointment

From: Taylor, Jillianne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=50944bd17adb440d98651290972c7224-Taylor, Jil]
Sent: 9/2/2021 1:31:48 PM
To: Taylor, Jillianne [Taylor.Jillianne@epa.gov]; Honnellio, Anthony [Honnellio.Anthony@epa.gov]; Hudson, Scott [Hudson.Scott@epa.gov]; samfritcher airborneaspect.com [samfritcher@airborneaspect.com]; Craig S McGee [craigmcgee@airborneaspect.com]; gerrybroyles@airborneaspect.com; Bob Kirby [bobkirby@airborneaspect.com]; James Crisp [jamescrisp@airborneaspect.com]; Todd Seale [toddseale@airborneaspect.com]; James Glaviano [jamesglaviano@airborneaspect.com]; Barry Lane [barrylane@airborneaspect.com]; bradfritcher@airborneaspect.com; Steve Brister [stevebrister@airborneaspect.com]; jill.rene.taylor [jill.rene.taylor@gmail.com]; mark [mark@spectralsystemsglobal.com]; Serre, Shannon [Serre.Shannon@epa.gov]
CC: Argenta, Edward [Argenta.Edward@epa.gov]; Turville Rick [Rick.Turville@kalmancoinc.com]; robert.kroutil@kalmancoinc.com; Dess Brian [brian.dess@kalmancoinc.com]; Stapleton, Jeff [jeff.stapleton@kalmancoinc.com]

Subject: Pre-Flight Brief (Ida)
Attachments: Mission Order Hurricane Ida 11Sep21.docx; ASPECT Proposed Grid Lines for 11 Sept Oil Mission.pdf; Aspect Targets-all.xlsx
Location: Microsoft Teams Meeting

Start: 9/11/2021 11:30:00 AM
End: 9/11/2021 12:00:00 PM
Show Time As: Busy

Required Attendees: Honnellio, Anthony; Hudson, Scott; samfritcher airborneaspect.com; Craig S McGee; gerrybroyles@airborneaspect.com; Bob Kirby; James Crisp; Todd Seale; James Glaviano; Barry Lane; bradfritcher@airborneaspect.com; Steve Brister; jill.rene.taylor; mark; Serre, Shannon
Optional Attendees: Argenta, Edward; Turville Rick; robert.kroutil@kalmancoinc.com; Dess Brian; Stapleton, Jeff

Hi Team!

So I believe you all have heard by now that we have a new mission for Saturday, this time looking for oil spills along the coast. The Louisiana Oil Spill Coordinator's Office provided a list of points where oil had been seen/detected over the past few days, but they are really looking for more wide-area coverage to track the sites that have already been identified and to look for more sites.

We think the best way to try to accomplish this will be to fly a grid pattern. We asked LOSCO to provide a selection of (8) 10x10 mile grid boxes which they would like us to work in. I have attached an example of what we suggested to them in the attached PDF. They will tell us sometime in the morning exactly which areas they would like us to cover. We will plan to fly the grids selected by LOSCO in lines flown 2 miles apart. Keep an eye ahead on the horizon, and if you see a potential sheen that is not in your direct heading, make an adjustment to the flight path so that you can fly over the observed sheen. We will also have a list of the GPS coordinates in each grid cell, and if a previously identified target does not directly fall under our flight path, we will let you all know to adjust the flight path so that you pass over it (keeping in mind that the IRLS has a ½ mile wide measurement swath).

We can go over more detail in the pre-flight. Some other things to note:

1) Pack some snacks/extra water. This may be our only day of flying because of an incoming weather system, so we will try to maximize our flying time down there. We will likely refuel in Houma, which does not have power, so likely no food options. We apologize in advance for the discomfort this will bring, we appreciate you all for making sacrifices for the mission!

2) Before we take off, Kalman will need to make an adjustment to the IRLS configuration file so that the oil analysis processing can be done. All they need is the plane hooked up to power so the computer can be turned on and the satellite connected. If this could be done before the pre-flight brief so Kalman can be working on that while we talk, that would be great.

I'm sure there's more, but we'll all talk soon enough. Get some rest and we'll talk in the morning!

Thanks,
Jill

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Message

From: Jill Taylor [jill.rene.taylor@gmail.com]
Sent: 9/11/2021 12:25:54 PM
To: Taylor, Jillianne [Taylor.Jillianne@epa.gov]
Subject: Re: FW: ASPECT Grid Flight
Attachments: LOSCO grid lines and targets.kmz

On Sat, Sep 11, 2021 at 6:00 AM Taylor, Jillianne <Taylor.Jillianne@epa.gov> wrote:

From: Gina Saizan <Gina.Saizan@LA.GOV>
Sent: Saturday, September 11, 2021 1:14 AM
To: Taylor, Jillianne <Taylor.Jillianne@epa.gov>; Delgado, Eric <Delgado.Eric@epa.gov>; Moore, Gary <Moore.Gary@epa.gov>; Patel, Anish <patel.anish@epa.gov>
Cc: Argenta, Edward <Argenta.Edward@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Daniel Lambert <Daniel.Lambert@LA.GOV>; Kelli Braud <Kelli.Braud@LA.GOV>; Karolien.Debusschere@la.gov; Katie Bowers <Katie.Bowers@LA.GOV>
Subject: RE: ASPECT Grid Flight

Please see attached:

1. Adobe doc - Revised Scope of Work based on feedback from ASPECT team
2. KMZ with Grids 1-8 depicted
3. Excel file with four corner coordinates for each grid in tabs, along with known spill coordinates within that grid

Hopefully these files get us where we need to be tomorrow. Thank you for all your help. May not be awake at 6:00 AM, but call anyway if you have any questions.

Sincerely,

Gina Muhs Saizan

Program Manager

Louisiana Oil Spill Coordinator's Office

Department of Public Safety

Physical Address: 7979 Independence Boulevard Suite 104 Baton Rouge, LA 70806

Mailing Address: P.O. Box 66614 Baton Rouge, LA 70896

225.925.6606 main office

225.925.7016 desk

225.933.1600 mobile

From: Taylor, Jillianne <Taylor.Jillianne@epa.gov>
Sent: Friday, September 10, 2021 9:58 PM
To: Delgado, Eric <Delgado.Eric@epa.gov>; Moore, Gary <Moore.Gary@epa.gov>; Patel, Anish <patel.anish@epa.gov>
Cc: Argenta, Edward <Argenta.Edward@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Daniel Lambert <Daniel.Lambert@LA.GOV>; Gina Saizan <Gina.Saizan@LA.GOV>
Subject: RE: ASPECT Grid Flight

Hi Eric,

After talking with Gina, it seems like there is interest not just in hitting the targets on the list, but also in wide-area surveillance to identify new areas. A lot of the targets are just places where oil sheen was observed by other surveillance missions, so they want to see if those sites still have oil, but they are also interested in looking for new sites. We think the flight plan with grid lines will be more efficient than trying to jump from site to site, and it will give us the opportunity to look for new sites.

We will instruct the flight crew to fly the grids selected by LOSCO in lines flown 2 miles apart. They will keep an eye ahead on the horizon, and if they see a potential sheen that is not in their direct heading, make an adjustment to their flight path so that they can fly over the observed sheen. We will also have a list of the GPS coordinates in each grid cell, and if a previously identified target does not directly fall under our flight path, we will instruct the crew to adjust the flight path so that they pass over it (keeping in mind that the IRLS has a ½ mile wide measurement swath).

We believe that with this operation plan, we can cover 8 10x10 mile wide grid cells. Part of our flight planning has to involve lining up for our data collection passes – the IRLS requires 4 minutes of straight and level flying prior to data collection because of its internal gyroscope. These types of straight flight lines will allow us to collect data much more efficiently than if we were trying to fly from point to point and making lots of hard turns.

I hope this helps. Please let me know if you have any further questions!

Jill

From: Delgado, Eric <Delgado.Eric@epa.gov>
Sent: Friday, September 10, 2021 9:44 PM
To: Taylor, Jillianne <Taylor.Jillianne@epa.gov>; Moore, Gary <Moore.Gary@epa.gov>; Patel, Anish <patel.anish@epa.gov>
Cc: Argenta, Edward <Argenta.Edward@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>; Daniel Lambert <daniel.lambert@la.gov>; Gina Saizan <Gina.Saizan@la.gov>
Subject: Re: ASPECT Grid Flight

This is a a change in scope so we need to manage expectations for what we feel we can accomplish based on this new information.

I think your suggested plan will work but we need to let LOSCO know how much we think we can accomplish per day given this different approach.

Can you reply to all of us in this thread tonight?

Thank you for being so flexible Jill!

Get Outlook for iOS

From: Taylor, Jillianne <Taylor.Jillianne@epa.gov>
Sent: Friday, September 10, 2021 9:07:36 PM
To: Delgado, Eric <Delgado.Eric@epa.gov>; Moore, Gary <Moore.Gary@epa.gov>; Patel, Anish <patel.anish@epa.gov>
Cc: Argenta, Edward <Argenta.Edward@epa.gov>; Honnellio, Anthony <Honnellio.Anthony@epa.gov>
Subject: FW: ASPECT Grid Flight

Hello Eric, Gary, and Anish,

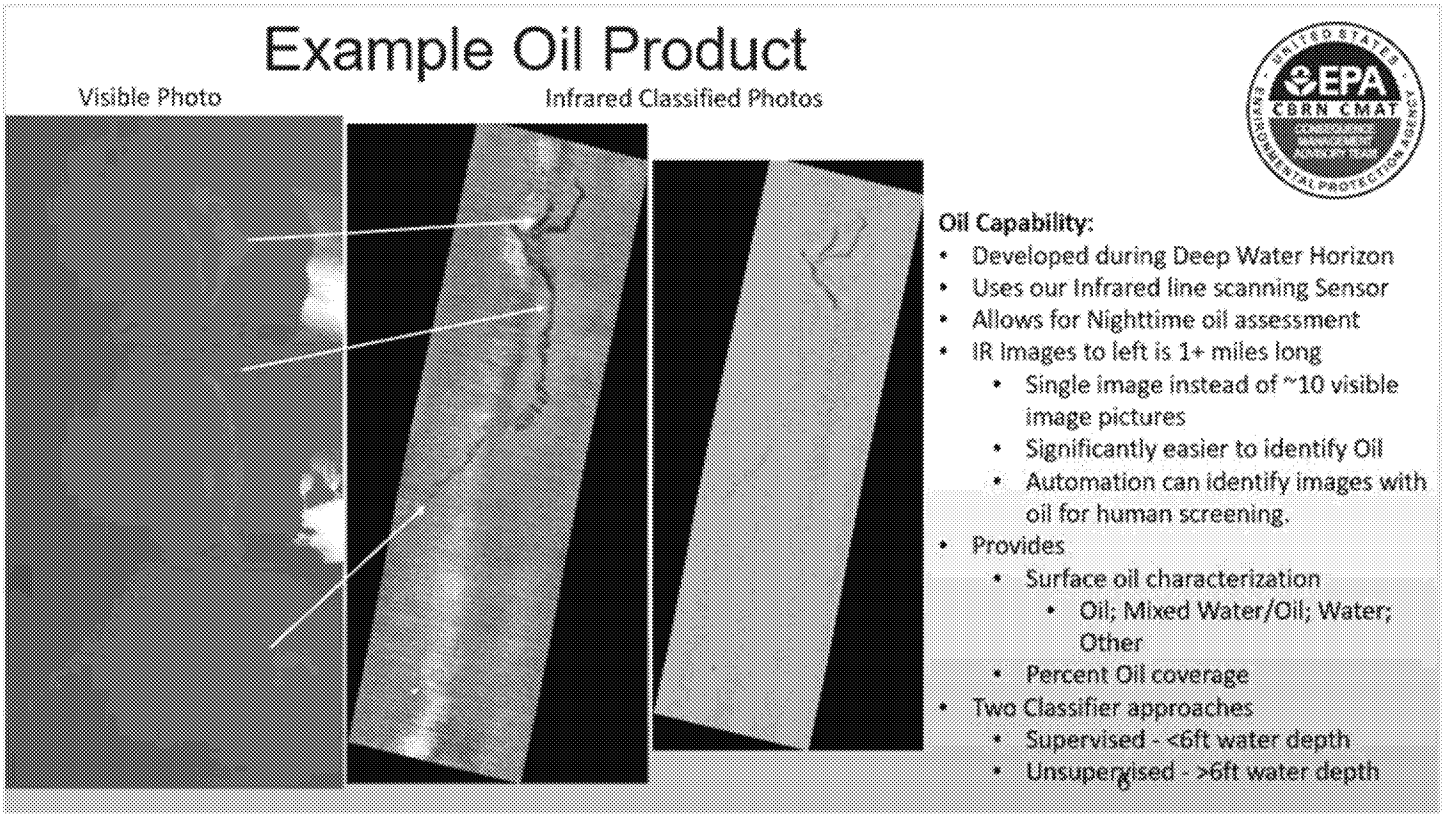
I spoke with Gina Saizan this evening and she was looking for suggestions for how we might best execute the oil surveillance mission. She said the points that they had provided were places where oil had been seen/detected over the past few days, but they are really looking for more wide-area coverage to track the sites that have already been identified and to look for more sites.

We discussed a plan to execute a systematic grid flight pattern while trying to identify targets of opportunity within the cells. We asked LOSCO to provide a selection of (8) 10x10 mile grid boxes which they would like us to work in. We plan to fly straight lines spaced every two miles within the grid boxes. The IRLS produces a ½ mile wide foot print underneath. We'll tell the pilots to watch for sheens and if they should identify one that may be missed with our grid design we may adjust our flight path to make a pass and collect data on them.

The back-up plan to this grid approach is connect the dots with the way points in an efficient manner.

We asked LOSCO to pick which grid boxes they'd like us to focus on. We provided them with a heat map analysis of their POIs with 10x10 mile cells.

I'd also like to pass along this slide to help illustrate to LOSCO the data products they will receive.



I have provided the email that I sent to Gina with the example grid pattern below – they will provide us with which cells they would like us to cover in the morning. Please let us know if you have any questions/suggestions.

This will be a new mission type for the crew, but I spoke with both sides of the contracting teams and they are ready and up to the challenge.

Thanks,

Jill

From: Taylor, Jillianne
Sent: Friday, September 10, 2021 8:51 PM

To: Gina.Saizan@la.gov
Subject: ASPECT Grid Flight

Hi Gina,

I have attached a PDF with an example of the grid lines that we think would get us the most aerial coverage while also trying to maximize efficiency. We think we can do up to 8 10 mile x 10 mile grid cells by flying 2 mile flight lines. If you just let us know which 8 cells you would prefer (preferably in a 20 mile x 40 mile configuration, though we can adjust if you have a preference), we will make our plan accordingly.

Please let me know if you have any questions!

Thank you,

Jill

Jill Taylor

Atmospheric Scientist, ASPECT

CBRN Consequence Management Advisory Division

Environmental Protection Agency

1201 Elm St., Dallas, TX 75270

Work Cell: 214-406-9896